Vol 4 No 6

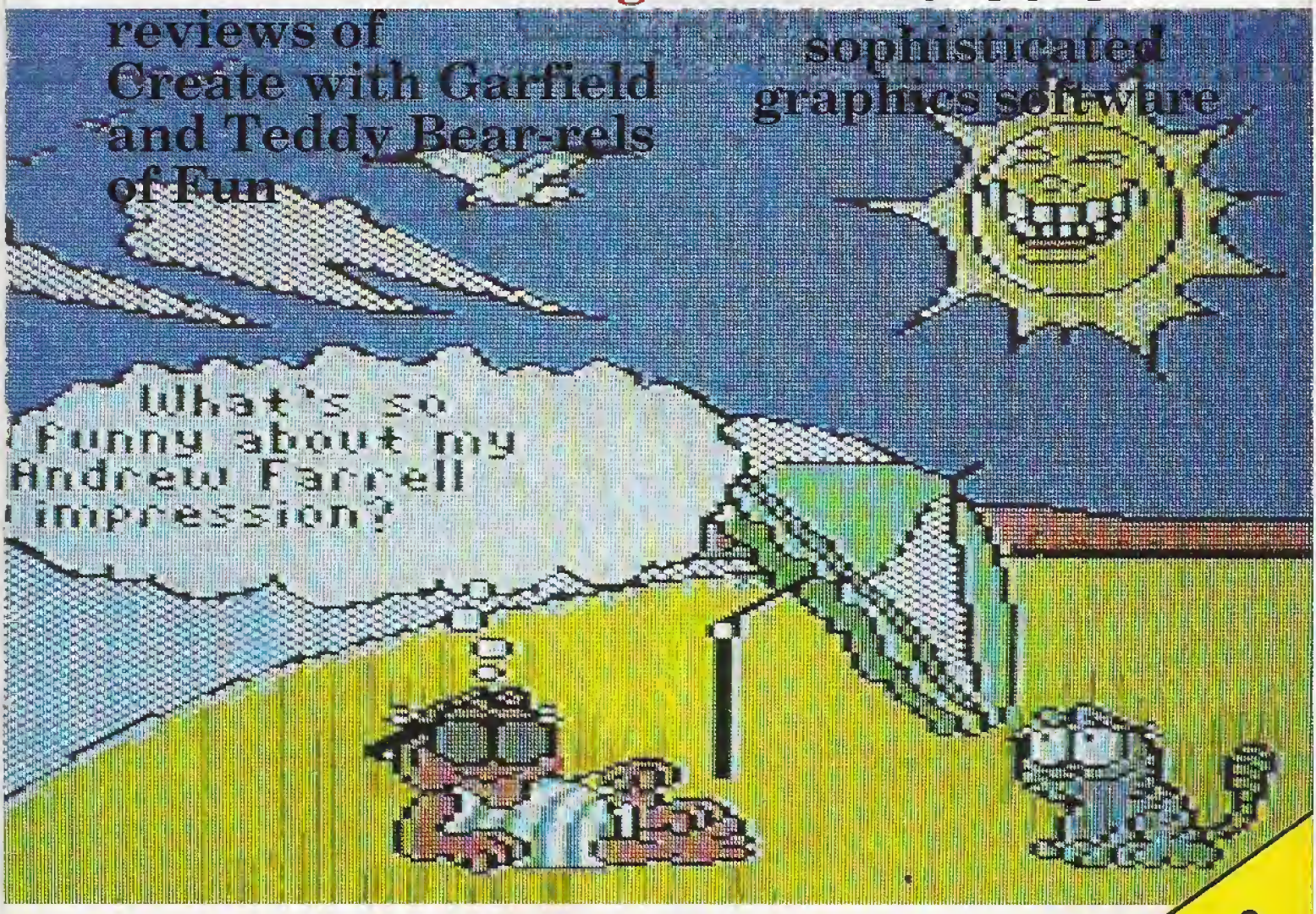
The Australian COMMODORE REVIEW

June $3*

The Independent Australian Magazine

Personal Publishing - reviews of Create with Garfield and Teddy Bear-rels of Fun

Artist 64 sophisticated graphics software



User defined characters

Putting your function keys to work

Amiga Column

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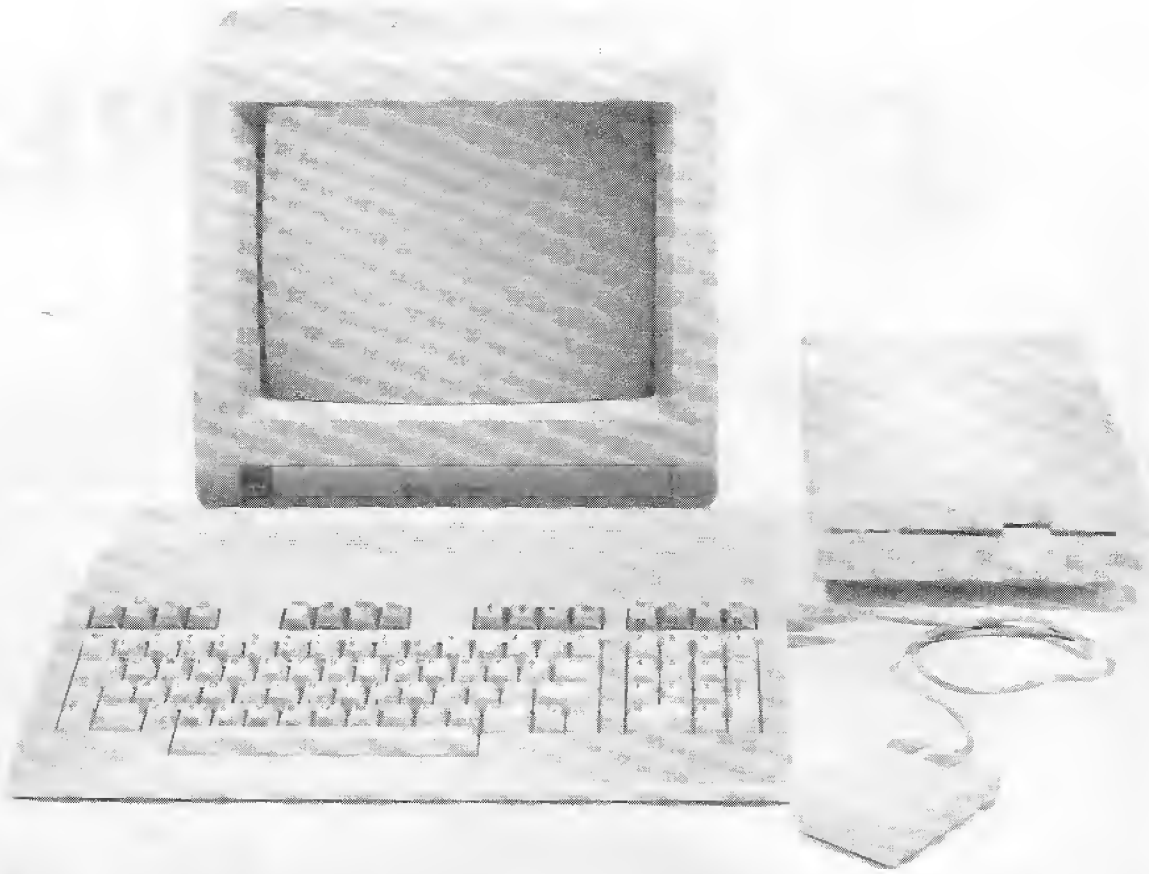
*Recommended retail price



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...so powerful, it's 3 computers in 1

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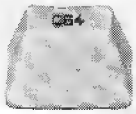
It's a family and education computer!



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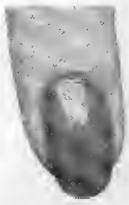
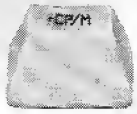


It's an advanced business computer!



The Commodore 128 lets you use software packages like 'Wordstar, dBase II' and Supercalc', all in 80 columns. The Commodore 128 gives you all the computing power most businesses will ever need now or in the future.

Power without the price. $699.

The Australian Commodore Review

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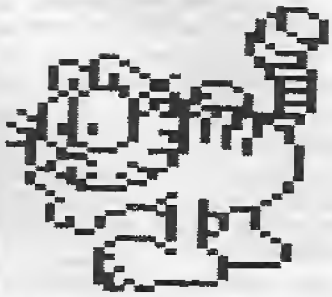

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Editorial

This month we continue our look into the world of personal publishing with reviews of *Create with Garfield* and *Teddy Bear-rels*. Gareth Powell also rounds up what's available for true desktop publishing on the Amiga and the Commodore PCs. In the near future we hope to be able to produce the *Australian Commodore Review* fully on Commodore equipment.

No doubt this task will be far easier with the impending arrival of both the Amiga 2000 and 500 in late June.

Around the following month we will be launching the first issue of what we hope will grow into a fully-fledged magazine. It will be in the form of a special section for Amiga users, included within *Australian Commodore Review*. We will review new products, provide tutorials and guides to using your machine and also include a swag of columns covering various aspects of the Amiga.

Emphasis will be on using the Amiga rather than programming it, however some more techincal articles will appear. At this time we would love to hear from any budding Amiga users who also consider themselves to be reasonably talented with the pen. The arrival of this new section will give Commodore 64 owners back some of the space the Amiga has been gobbling up and provide Amiga users with a definitive area to read about their machine.

We have a list of available software for the Amiga which we hope to publish soon. New and expectant owners of this computer will be consoled to know that on average we are now receiving ten new titles per week. There is no doubt in our mind that this is indeed the machine of the future.

The Commodore 64, despite the best eforts of other computer companies, continues to survive - in some countries remaining the biggest selling home computer to date. An emulator of this all time big seller for its newest cousin is still unlikely.

Unfortunately, in this issue we were unable to make space for one of our popular regulars, Adventurer's Realm - but never fear, it will be back with us next month. Our sister magazine, *Home Computer GEM*, also contains an Adventure Column by the same name for those who want to keep really up to date.

Until next month, happy computing!

Andrew Farrell

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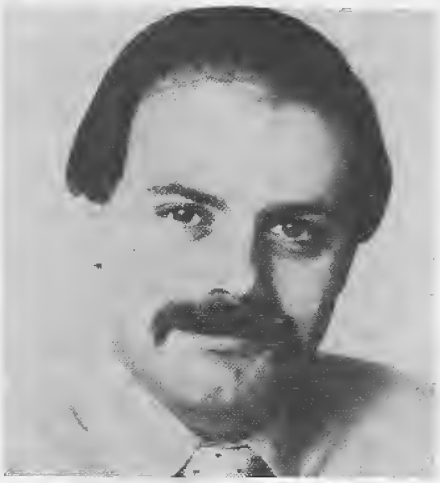
RAM RUMBLINGS

COMMODORE'S PROFITABLE THIRD QUARTER RESULTS

Commodore International Limited has announced net sales of US$169.5 million and net income of US$1 million, or US$.03 per share, for the third fiscal quarter ended March 31, 1987. This compares with net sales of US$182.3 million and a net loss of US$36.7 million for the year ago quarter.

For the nine months ended March 31, 1987 the Company reported net sales of US$616.3 million and net income of US$26.5 million, or US$.83 per share. During the same period, shareholder's equity increased approximately US$38 million.

In commenting on the results, Irving Gould, Commodore's Chairman and Chief Executive Officer, said "We are pleased with the continuity of profitability over the last four quarters. Although this quarter's sales reflect a slowdown, particularly in the U.S. from the high level of the December quarter, we have a very strong performance overseas which accounted for over 70% of total revenues."



Tony Serra
Managing Director

Commodore alsc announced the completion on April 28, 1987 of the final documents renewing the Company's master credit facility with its major lending banks. This finalises the agreement in principle which was reached with the banks last October for a credit facility of $140 million.Since then, the Company has reduced this facility by approximately $25 million. Over the past 18 months, total bank debt has been reduced by $110 million.

"With the new Amiga products coming on stream and our continuing efforts towards further cost and operating efficiencies, we are well-positioned to propel the business forward" he said.

Australian and Asia/Pacific managing director, Mr Tony Serra said the local operations were contributing greatly to Commodore's international success.

Mr Serra said, "Sales in Australia had risen 91% in the month of March against last year and maintained a level of 22% above last year for the fiscal year to date.

Our progress locally is right in line with Commodore's targets, but I believe sales will increase rapidly in coming months following the recent release of the Amiga 500, Amiga 2000, the PC-5 and the PC-40, and Commodore's push into the business market.

As a reflection of our success, Commodore employees have been rewarded with a 6 per cent pay bonus. *(We at the Australian Commodore Review, hope to be invited over to Commodore for our share of the 6%, perhaps by way of a free canteen lunch. - Ed.)*

A year ago, employee bonuses were not even contemplated, but as we are back on an even keel again our staff are beginning to reap the rewards of our success", Mr Serra said.

RE-BOUNDER

Bbbbbounder is bback! The tennis ball that doesn't play tennis is returning to the games scene - not to brandish a racquet but to star in his very own sequel.

Imagine a 3D world of colourful hexagonal slabs, collapsable floors, high speed bouncing and superb sound punctuated with impenetrable walls, mystery bonuses and super-intelligent waves of aliens who hunt in fleets.

Bounder, as you'll remember from the first program to feature him, is a highly intelligent tennis ball. With your help he must hurtle through 18 levels of enemy infested scrolling platforms in an attempt to reach the Master Alien. Many obstacles have to be overcome along the way - fleet aliens ofever-increasing intelligence must be shot and war must be waged on the sentinel who waits at the end of each level. Bounder's pressure must be monitored, as if it is ignored, it will cause him to deflate. On the other hand, repressurising Bounder too highly will result in a burst ball!

Self-protection comes in the form of designer armour plating and this, along with the all important fire power, can be swapped or bought at specialist shops dotted throughout the course of the game.

Simply continuing to exist in the face of all this danger is an uphill task. Re-Bounder will keep you busy for days with its energy orbs, smart bombs, flashing bricks, vicious aliens and doubtful surfaces. Nothing is what it seems but every question mark must be explored and every alien fought to the death if you're to succeed in Re-Bounder.

Re-Bounder offers you the chance to compete against the odds in a world where speed and dexterity rule and breakneck risks pave the way to success.

Due for release around July. Re-Bounder may well be as fiendishly addictive as its predecessor.

COMMODORE WAREHOUSE SALE

If you missed out on Commodore's warehouse sale, you missed out on some real bargains. The best buy of the day would have to have been the old trusty Commodore 64 in original drab grey casings for just $99.They went very quickly, as did the Incredible Keyboard from Ozisoft, which was eventually being given away for free by the end of Sunday.

We were there, chatting to new and old owners of Commodore's vast range of machines. So was Imagineering, and Tim Strachan with his second issue of Megadisc - a disk magazine for the Amiga. Next year promises to be even better, so be sure to be there.

LETTERS

TO THE EDITOR

1571 DISK DRIVE

I have a 1571 disk drive (in my 128D) and whilst messing about with it recently I discovered something which I have not seen mentioned in the manual or in any magazines I have read.

With the drive in 1541 mode I found I still had control of the heads using the 'UO>HO' or 'UO>H1' commands. Commodore do mention the commands in the disk drive manual but add in 1571 mode only, this is just not the case. Using these commands it is possible to format the two sides of the disk separately but without turning the disk over.

Of course there are advantages and disadvantages to this facility. The main disadvantage being that a normal 1541 cannot read the second side at all. On the plus side it does direction which removes the main objection to 'flippies'. For one's own programs one has most of the advantages of a double sided drive without the bugs of the 1571.

Bruce Lloyd
Dapto, N.S.W.

SPLAT FILES

The Problem:- The par about "asterisk" or "splat" files advises to "scratch the problem file(s) before they cause trouble".

Scratching a "splat" file is almost guaranteed to cause problems by "poisoning" the Block Availability Map (BAM)! This would result in further (good) files also becoming corrupt or lost.

The Proper Solution:- There are two possible avenues available:-

a]If the file is not important (e.g. the problem occured in the course of a backup), or is short and readily re-typed then simply Validate the disk. This may be done by typing (in Direct Mode)

OPEN 15,8,15 <Return>

PRINT #15, "V0" <Return> (Remember to include the 0)

CLOSE 15 <Return> (After the cursor returns and the red disk activity light goes out).

If you have the DOS WEDGE, EPYX FASTLOAD (or similar utility) you can simply type

@ V0 <Return>

to achieve the same result.

Validating the disk will result in the information/data in the file which did manage to get on the disk before the problem being lost.

b] If the file contains important data (e.g. a Sed data base file or wordprocessor file) then some of the information may be recovered, provided NO OTHER DISK OPERATIONS WERE ATTEMPTED AFTER THE "SPLAT" OCCURED.

With care you should be able to recover all but the last block of a program (PRG) file or all but the last entry of a sequential (SEQ) file.

To do this requires the use of a disk SECTOR EDITOR such as the "Display T&S" on the 1541 Demo Disk or the editor contained in "Fastload" or similar. Fixing the problem requires being able to recognise the end of the "good" part of the wanted file and then restoring "sectorlinks" (and if a PRG file adding three "00" bytes at the end).

If this is too involved for the faint-hearted, all is not lost. There are still two other ways to rescue the data, one of these still requires some skill and knowledge of disk operation.

Firstly you could try re-opening the "splat" file with the form:-

OPEN 2,8,2,"filename,P,M" if it is a PRG type or

OPEN 2,8,2, "filename, S,M" if it is a SED type.

Of course, once you have opened the channel you must provide the appropriate read commands (GET# or INPUT#) to read in the data. Watch for the point where the data corrupts and close the file. Resave the recovered data to a known good disk, validate the bad disk and then copy back the file if it must reside on a particular disk.

(Note: the "M" command above stands for "Modify" and together with "A" for Append is undocumented in the original 1541 manual. I believe it is well covered in the second edition now available for Commodore. It is also explained fully in the book *Inside Commodore DOS* by R. Immers & G. Neufeld p177. Lastly, and probably simplest of all is to use a program called "Unsplat" by Ronald Carnell. This program appeared in the January 1987 edition of *Compute!* magazine page 83. It tackles recovery of PRG, SED and USR "splat" files through a series of on screen prompts. Typing this (machine language) program in requires the use of *Compute!s* program "MLX".

Well, there it is! Rather long winded but I am sure your editing

skills can find enough to "blue pencil".If you haven't got a copy of the *Compute!* programs perhaps you could get a copyright clearance from them, I am sure most readers would appreciate it. Fortunately I haven't had to use "Unsplat" as yet, but I have typed it in just in case! I hope the information above is of assistance to you in maintaining a high standard of editorial content in the only decent Australian magazine for Commodore owners.

John Asplin
Riverstone, N.S.W.

DOLPHIN DOS DOUBLER

I am a librarian at Reynella East Primary School and use a Commodore 64 with; 1. Dolphin DOS
2. 1st Nice Modem

My Problem: I would love to screen dump using the Dolphin DOS program, while entering data base (e.g. *Presscom*) with the modem: but both use the same port in the 64 and therefore this is impossible.

Is it possible therefore to obtain(anywhere in South Australia) a double adaptor, to make it possible to use both of these units at the same time?

I hope that you can offer help with this problem.

Staff members of the school make the distribution of your magazine very difficult, and its movement is constantly monitored by all readers. Keep up the good work.

Paul Paddick
Reynella East, S.A.

ED: A new version of Dolphin DOS provides the double adaptor you describe. Contact Micro Accesories on (08) 287 0191

ANOTHER MAGAZINE

Coming home after some weeks away, I found among my mail the details of your Commodore Family Pack Subscription Offer. It is a great promotion idea, and I wish you well with it, but I was not, at first, going to subscribe. Now I am sending you a cheque for $34.00, and, as I may well be typical of many potential customers, it may interest you to know why I have changed my mind.

I have had a C64 for the past four years. I use it constantly and expect to go on doing so. I use *Easy Script* for my professional writing and for letters like this one. I use *Superbase* for a variety of purposes, and many utility programs, several of which I have written myself. You may best gauge the depth of my interest from the fact that, as I write to you now, I have within my reach the latest copies of *Ahoy!, Your Commodore, Transactor, Commodore Magazine* (the American one...though I do, as a matter of fact, also have most issues of Kim Book's sadly-fated Australian magazine, too), *APC, Your Computer,*

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LETTERS

both the American and German editions of *Run*, and the German *64-er* and *Commodore Welt*.

Do I need another magazine? Not when I am thinking of cancelling some subscriptions. And not one that doesn't take me seriously as a serious computer user. Nevertheless, because of the dodger you sent me, I thumbed through your latest issue at the newsagent's, and found a surprising amount of stuff that was right down my street. I skipped over your Game Review and the near-English of Arcade Action, but I was interested to read Ram Rumblings and all your hardware reviews. Hints & Tips are usually worth reading in any magazine, and there is always something to be learned from an article like Jason Briggs' on Anti-Reset Switch Routines.

What actually sold me, however, was the discovery that you have Paul Blair writing a Superbase column. As those of us who have used this excellent database for years know well, everything written about it ... even Bruce Hunt's recent and fascinating but by no means definitive book has merely pointed to the possibility of more and more new applications and programming techniques being discovered. I am delighted to think that I shall be regularly reading about such applications and techniques in your publication, the more so since the writer is Paul Blair. I have read a great deal of this material in local and overseas publications, and appreciate very much his ability to write with clarity about even the most complicated matters. I enclose a question which he may care to answer in his column.

You may consider the cheque to be the only important piece of paper in this envelope. I hope not. But I also hope that I'll be a sufficiently satisfied reader to send you another when the time comes.

Robert Peach
Cremorne Point, N.S.W.

ED: The cheques always help, but we especially welcome constructive comments such as yours. Without these it is hard to know for sure what we are doing right or wrong. Many thanks.

PRINT SHOP

I wrote sometime early this year concerning the use of *Print Shop* and my Riteman C+. The problem was that the printer would do a LF after each printed line leaving a blank line then a printed one. If anyone has had a similar problem here's how to fix it. It is done by typing the following line:

OPEN 1,4 : PRINT#1,CHR$(27)
CHR$(40)CHR$(0);:CLOSE1

I have also had similar problems with GEOS but the above line should fix it.

If it doesn't you can make a backup of the MX-80 Printer /Driver and change the Pitch from 8/72 inch to 3/72. This can be done with a disk editor as follows.

Find out the track and sector of the BACKUP of the printer driver. This is done by finding the name of the driver. The number closest to the name is the sector and the next to the LEFT is the track. Locate the track and sector and then follow to the next. Then find BYTE $67 (HEX), and change it to 03. Then WRITE that block.

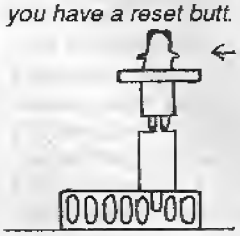
Richard Carde
The Gap, QLD.

RESET SWITCH

I am a fan of the *Commodore Review* and the *GEM*. I wrote this letter referring to the magazine called *GEM*. Sometimes this magazine puts up some hints and tips for games (which I love) but some of them I can't type in, though I have the game. What I am saying is that some of the pokes for the C64 need a resetting, I don't know how to reset my C64. If you know, please tell me because I have some of the games you have in the tips section and I am desperate. Thank you.

Richard Sanchez

ED: You can purchase a RESET Switch from computer outlets, however the simplest way is to solder a wire to pin one and pin three of your user port. Connect a momentary contact switch at the other end and you have a reset butt.



COMMODORE PLUS/4

Some time back, I bought a commodore Plus/4 computer system in the belief of getting a machine with a good company backup. Obviously I was not very happy to see this company almost going down the drain (as a result of the Plus/4 failure, wasn't it?). So I was leftwith a good computer, bad software and no support. Things are lightening, however: Sell outs increased the number of users and as a result the production of software. The big event was the release of the *Script/Plus* wordprocessor which comes as ROM in a cartridge and can easily be exchanged with the ill-fated 3+1 slakware inside the machine. This small additional investment will transform your machine into a real office workhorse (no joke)!

Now I am wondering just how many desperate and frustrated Plus/4 Users there are in Australia and whether it might be worthwhile if we could get together to uplift our spirits.

So, if you are interested in infoswap and software, drop me a line. I have a few goodies lined up for the discerning Plus/4 user. A little taste: did you know, that your Plus/4 has a real UART built in? (a UART or ACIA is a chip, which makes modem operation and inter computer communication a finger snip!). The 64 and the 128 have to emulate this device in software.

But there are certainly fields, which some of you have found out about, which are still secrets to me and others. Imagine, if all this knowledge could be shared.

Write to: Adrian Keil, Grooms Hill Road,Koonya,Tasmania,7187

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The laws of Pure Mathematics cannot be applied to this game due to excessive imperfections associated with the equipment used in the Draws. The variations encompass the balls, the barrel, the number and speed of rotations, alignment and positioning of the balls on the grid, and even the varying atmospheric and temperature conditions, just to mention a few. Hence TATTS 45 II is justified by its use in finding inclinations, repetitions, tendencies and patterns based on the above facts.

TATTS 45 II is a completely self contained program incorporating 6 main programs which are used to perform a complete analysis of numbers you have chosen. By following the guidelines as laid-out in the 14 page manual provided with each program, you can select those higher-chance numbers thus improving your chance of winning. The main options are LIST, SEARCH, STATISTICS, NUMBERS, CHANGES, and DATA 45.

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For Commodore 64, 64C, & SX64

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And if this is not enough, we also include a utility disk which contains Bootmaker, File Copiers, Cartridge Cracker, Disk Back-up, and over 110 entry points.

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MEGADOS V3.0

from the AUTHORS of SUPERDRIVE MKII DOS

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FEATURE

Desktop publishing on the Amiga and Commodore

By Gareth Powell

The buzz word in computing at the moment is desktop publishing. It has been hailed as the biggest revolution since the launch of the personal computer. And this is probably true.

Because desktop publishing is the only aspect of personal computing which saves you money. Other functions of computers are promised to make you faster, better, and operate more efficiently.

Desktop publishing does none of those things. It just saves you money - and time.

It is therefore desperately important that any computer manufacturer should be in a position to offer desktop publishing as part of the total package.

AMIGA

On the *Amiga*, up to now, it has been perfectly possible to do desktop publishing to what one might refer to as upper kiddywinkie standard. That is, there were packages available which allowed you to put together a news sheet, an advertisement, a small magazine and then print it out. It didn't look much. Something like your school magazine on a bad issue. But it was desktop publishing.

The reason for this up to now has been the absence of a) a sophisticated program and b) a page description language which can drive a computer.

More sophisticated programs are on the way. There are at least four being written for the Amiga at the moment and we should see them in Australia real soon now. Or certainly before the end of this year. (*Pagesetter* is available now, and supports Postscript- see the Amiga Column, page 34 of this issue.)

The absence of a page description language is something else again.

First of all let's explain what a page description language is and what it does.

When a computer normally sends information to a printer, it sends it line by line. This is perfectly satisfactory when you're working with a dot matrix printer. It is less satisfactory when you're working with graphics. And it's simply a non-starter when you're working with a laser printer.

And for serious desktop publishing a laser printer is a must.

With a laser printer, typically, you send the information one page at a time.

Accepting that, there are two ways of sending that page.

First, send it as a screen dump. That is, as a bit mapped graphics page.

If you use that method the results will, in truth, look less than jolly. That's because the resolution of almost all computer screens is not up to much. And the positioning of type on the page will not be precise.

The second way to do it is to use a page description language.

This is the way a page description language works:

To do a letter 't', for instance, instead of sending a series of instructions to the printer saying *"Go to a position on the page 256 points down and 156 across and put a dot, now go to a position next to it and put another dot and then keep repeating those instructions until that 't' has been formed"*, with a page description language you say to the printer *"Go into your memory and find the letter 't', enlarge it to the size that I want and then place it precisely at 156 across by 256 down"*.

For a page description language to be able to do that, it must have in the memory of the printer the typefaces that you are going to use.

At the moment the only page description language which is viable, which exists in the true form, is Postscript. And so what you need is a laser printer with Postscript built in. This at the moment Commodore simply does not have. In fact, the truth is, at the moment Commodore doesn't even have a laser printer.

That this will be remedied in the next few months is absolutely certain. There will be a laser printer coming from Japan and the story is that either it will have either Postscript built in or there will be a card available to supply it with Postscript. On that basis we will have a proper desktop publishing system. But will the Amiga be able to handle it?

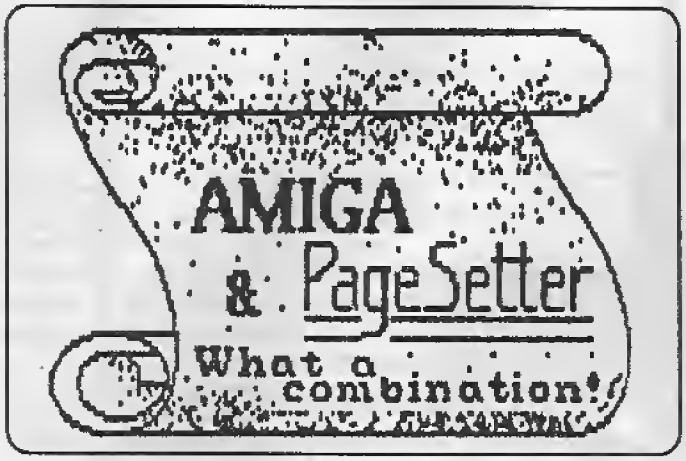
The answer is yes. Superbly. Indeed as the Amiga develops it will probably become the best desktop publishing computer that's available on the market.

The reason for this is simple. One part of the Amiga operates as a PC which means that it will have access to all of the new desktop publishing programs which have been launched in the past few months and which are going to be launched in the months to come. Specifically, that is *Ventura* and *Pagemaker* which are the two standard desktop publishing programs.

But on the right hand side of the Amiga there is the immense graphics capability driven by the Motorola chip - the 68000. So far the following has not been designed - but it will be, soon. That is the ability to create illustrations on the 68000 side of the Amiga and then port them over to the PC for inclusion in desktop publishing documents. On that basis the Amiga will able to integrate text and illustrations at a level which no other computer company on the market can approach. And provided there is a laser printer with a Postscript driver we will have the ultimate desktop publishing tool.

COMMODORE 40

But in the commercial environment



the Amiga may not be the way to go. And the answer in that case is to use the Commodore 40.

The Commodore 40 has all the attributes of a desktop publishing machine in that it is extremely fast, contains a large amount of memory and can address a high resolution screen.

Let's take that step by step.

What is needed with most desktop publishing is speed, speed, speed. The Commodore 40, using as it does the Intel 80286 chip running at 10 megahertz, is very brisk indeed. It's about twice as fast as the standard IBM AT which is in itself no slow coach.

At the same time the Commodore 40 has a random access memory to hold any of the serious desktop publishing programs. (Note the fact it is normally configured with one megabyte of memory divided into two banks of 520K. This is not efficient for desktop publishing which really requires 640K of clear memory. It's very simple to change this by moving one jumper from pins 5 to pins 6 on position J1. This way you can use the desktop publishing programs to their utmost capabilities.)

The monitor that comes supplied with the Commodore 40 is in truth not totally suited to desktop publishing. But then neither is any monitor supplied with any standard computer sold in Australia today. The idea is to go for a monitor with a far higher resolution. Probably the Wyse 700.

The computer then can produce pages of a standard which are precisely the same as any other desktop publishing system on the market. But what printer will it drive? Well, because the Commodore 40 is an IBM clone of very compatible design you can drive almost any Postscript designed printer on the market.

For example, the Apple Laserwriter (if you'll excuse the expression) has an RS 232 port on the side and the Commodore 40 can be connected into it and drive the printer to produce true desktop publishing output.

Plainly this is not the end game. The idea of Commodore producing a machine which works attached to Apple equipment is not going to bring joy and happiness in the headquarters of Commodore at the King of Prussia. Therefore it's axiomatic that Commodore will be producing a laser printer. Best information we have is that this will be coming from Oki in Japan and that either it's going to have the essential Postscript drive ability or there will be a slot inbuilt for the Commodore which will have Postscript on it.

So the question is, 'Is Commodore set to take advantage of the desk top revolution?' And the simple answer is a resounding 'Yes'. It has two machines which are superbly designed for the very task. It will soon have a laser printer for the output. All it will then need is a scanner to input the information. Look to see a Commodore scanner coming on the market within the next eight months.

This magazine will, in the very near future, switch over to being designed and produced totally on Commodore machines. When it happens we'll let you know.

PageSetter

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Behind The Screens

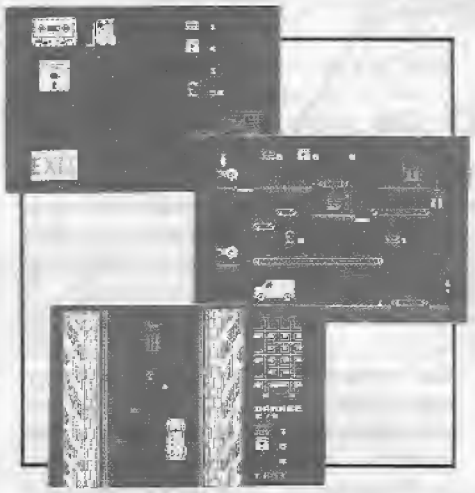
WIBSTARS

Wibstars is about the successful operation of a computer goods distribution company. The player must collect products from a central warehouse and then deliver them to his customers. The trick is to stay in business and make a profit.

It's tougher than y'all think, let me tell you . . . and great fun to play.

The first stage of *Wibstars* requires you to collect the goods to deliver to your customers. The goods in question are cassettes costing around $12, disks costing around $25 and computers costing $250. You start in business with $450, and the program will not allow you to spend more than this - believe me, I tried.

To collect your goods, move the fork lift truck (FLT) into contact with one of the stacks of goods. As long as you continue the joystick or keyboard command for leftward movement the FLT will automatically pick up goods. As soon as you release the FLT, it will take the goods to the waiting skip.



Now, remember people, about this circumstance here. It will only pick up goods if the fire button is continually depressed. If you release it to swerve back to an opposite stack in the corridor of the warehouse, then that is all that will register in the computer's memory. The more goods you pick up in the warehouse the more profitable your enterprise will be.

Master the first part of the collection before you try getting into distribution. When you have enough goods, take the FLT to the exit and begin the next stage of the program.

In the dispatch bay your goods wil drop from overhead chutes and you must catch them in your van as they fall. When all of your goods have been released from the chutes, the *Wibstars* program will automatically take your vehicle to the next screen. Be careful in your timing in this area because on screen are about five chutes and the goods drop randomly from each. The graphics for the little man on screen, the van and the goods are quite good here, though sound effects are lacking terribly, which detracts.

The next screen gives you a scrolling bird's eye view of the road and a map of the area. You have to drive to a shop and deliver your goods. There is a competitor's van right in front of you. You will be

AGENT ORANGE

This game is about killing weeds.

If you want to check out how someone could possibly put together a package about killing weeds of skill and knowledge with good graphics and realistic sound and make it interesting enough to play . . . then read on.

IARE. The Intergalactic Agricultural Research Establishment, founded to fuse Agriculture and Space Travel into a force which would make the colonization of other planets more practical and simple. The discovery of an Astalian alien agricultural station and the capture of an alien seedpod made farming on other planets not only possible but productive.

From this discovery, it was a simple step for the college to set up entrepreneurial types as self-employed space farmers who would plant and harvest crops and bring the valuable cargo back to Earth for sale.

The greatest unsolved problem at the

IARE is that of the farmer's traditional enemy - weeds. The Astalians have a weedkiller, the company knows this because they read references to it on their seed storage pods, but they can't synthesize it at all. It's every farmer's aim to one day capture some Agent Orange, but it's so far away from the Earth that no one has yet managed to find any.

So now you have a scrolling display that moves either left or right depending on which way you choose to fly. The graphics are not bad, and the sound effects work in well for whatever an intergalactic Weedkiller is supposed to sound like. You're in this heavy-engined aircraft soaring across the moonscapes of some ugly planet getting hostile over some green vegetation that you're not supposed to want there. Your farm consists of eight different planets.

When you start you have one mothership with eight daughter vessels, but if you are a successful farmer you can sell your crops and use your money to buy better armed, faster and bigger ships.

Each daughter vessel contains your seed pod store and unlimited fire power. Your shields are, however, very delicate, and will only defend you from a few hits.

Your screen display shows the weight of crops collected, the number of seed pods left, your financial position, you score and the number of daughter ships remaining. And beware of overloading your ships. Daughter ships crash if overloaded, and the momma ship jettisons cargo on take-off if overloaded.

Control of the ships I found to be rigid and a tad uncontrollable. What you've

by J. Mark Hunter

showered with computer goods and junk from the rear of his vehicle. Avoiding the junk, which will damage your van and cost you money, you can catch the cassettes, disks or computers by driving over them. You can sell them when you reach the shop. Different shops pay different prices for goods, and you can discover the good payers by exploration.

I erred here too. I thought driving over all the debris from the competitor's van made bonus points. I steered for every piece, even sitting on the guy's bumper to collect the stuff before it hit the ground. Bad move - I lost all my money. I didn't discover this till I finally read the manual. That's a big problem of mine . . . playing games right from the start without looking at the manual. I never know if getting shot in the face is good for me or not.

In the unloading area of the shop, your task is to move the goods via a series of lifts and conveyors from your van to the office. Your driver must be immediately adjacent to the back of the van, facing towards it. Pressing fire, you will then be able to choose the type and value of the package to be unloaded.

When the package is out of the van, the man kicks it towards the lift. In front of the lift is a conveyor, and in front of this is a lift-call pad. The man must walk on the pad and change its colour to call the lift. You must then get the package onto the conveyor so that it goes into the lift. If it goes under the lift go back to the van and get another package.

You can put a package in the lift, or travel in it yourself, but the lift will not accept you and a package. You will only get paid for what you deliver to the office. This is one dicey area.

But as well as being dicey, it's the phase of the optimum fun. Negotiating conveyors and rising planks with proper timing and walking speed so that your guy can load and off-load concisely. You get ample time, and gradually get the hang of what you have to do. The colour is good on the screen displays, and the antics of the little on-screen chap are quite enjoyable.

Distributor : I.S.D.
Publisher : A'N'F Software
Price : $34.95
Graphics: 79
Music: 76
Sound: 74
Presentation: 77

Documentation:70
Overall: 82

When your van is empty, take the man to the rear of the vehicle and press fire as though you were trying to get another package. The driver will then get back into the van and drive away. If you are still in profit the game continues.

Wibstars is a delightful game of action and amusement, and worthy of booting up on the screen for play that's not too vicious and not so totally absorbing that you don't get time to glance over to the other player and grin.

---

really got to watch out for is not running at a craft that you're firing at, because it takes a second or so delay in exploding and quite often you get mutually destroyed. It's even better to avoid them most times and get into the planting and weeding. Remember, you're a farmer, not a soldier. It's better to be that way. You live longer, keep the intergalactic little house on the planet family happier.

The most modern techniques of space planting are used by your ships, and this makes your task simple.

To plant a planet, simply fly over the virgin soil with your fire button depressed and the pods will be fired into the soil and start to grow. Any pods fired onto the weed infested land, i.e. land planted by aliens, or or land already covered by indigenous vegetation, will be wasted.

You can shoot and destroy the aliens who are trying to seed the planet and if you destroy an alien vessel it jettisons its seed supply which you can collect for extra points.

The planting process and the crop-dusting are a complicated feature, because in a lot of ways they're intertwined, Seeding and destroying are done with the same controls and shoot from the same holes in the ship's guns. It all gets down to the flying technique.

Only ripe plants can be harvested. Your harvesting is automatic as the daughter ship flys over the ripe green plants. The special self-seeding cultures developed from the alien genetic stock will grow further crops as time goes on, so keep watching your planted acreage for green plants.

IARE have not figured out how to harvest the alien crops, which follow the same growth colour patterns, but the research continues. It is possible to burn these crops by firing at a very low elevation.

When it comes to buying new ships and trading, I'd tend to get ambitious. Buy whenever you can and unload the vegetation whenever you can. You're a farmer, so you've always got food, but it's a source of income that can't wait around. Sell early, harvest as much as you can, then off load the produce.

Distributor : I.S.D.
Publisher : A'N'F Software
Price : $34.95
Graphics: 78
Music: 75
Sound: 76
Presentation: 83

Documentation: 74
Overall: 80

You'll have an interesting time with *Agent Orange*. Like I did, you'll want to get behind the wheel and do something different for a change beside shooting up robots and sneaking through mediaeval history in the dark. Yes, get yourself a supersonic crop-duster and a plot of moon and join the happy, satisfied ranks of the Agent Orange People today!

GAME REVIEW

BEHIND THE SCREENS - GAME OF THE MONTH

"SUN STAR"

by J. Mark Hunter

CBM SCREENSHOTS

Who and what determines a game of the month? Sometimes it could be something just too totally awesome that we've been hanging out for, for yonks, know it's about to hit the Ozi shores and can't wait to check it out for both our sanity and your discretion. Other times it's just the best of a bunch. One of the secretaries at the G.P. offices throws about a dozen discs in to the air and whatever Farrell catches first is the `game of the month.'

Next month you can be sure Andrew Braybrook's *URIDIUM II* will be etched to these pages...and this month...thrown against the laser printer till it finally sticks.

But, no, *Sun Star* is quite a little bit better than that...actually very good.

Set a few hours down the road in the early part of the 21st century, the Xxarion Corporation has placed its first solar energy grid in orbit around the sun, (so far, so good- logistics are perfect). The grid utilizes the suns energy to create special energy crystals that allow travel through space at the speed of light. Not too much time passes and a total of sixteen energy grids are in orbit around the suns of the star systems throughout the galaxy.

Hold the phone!

Unfortunately, time ain't getting any younger, and now at the dawn of the 22nd century, due to build up of unstable disruptive energy pulses, it has become impossible for supply craft to collect the energy crystals from any of the energy grids. And, to recover as many crystals as possible a supply craft has been totally re-designed giving it awesome speed and extraordinary fire power.

Handle: Sun Star.

Pilot: These words are looking at him.

And from out amongst some pretty amazing sound effects and suitably fine graphics, *Sun Star* begins to play. You must collect as much energy crystal from the grids as possible. Your aim is to fire at one of the four disruptor pulses that emit the energy crystals your craft is yearning for. You then pass over the crystal and head for the next disruptor until you have collected a full complement of ten crystals and head for a pass through the revolving warp gate. Here you fire a laser bolt into the hyperwarp cell to initiate a warp to the next grid.

It's a race against time, and accomplishment of certain success is up to you and your bod's dexterity levels.

Screen instrumentation is respectfully accommodating. One overall grid scanner and frontal 3D display. Status info showing up and all over the place, everything from energy bank status, the number of crystals collected on a particular grid, your craft's tracking condition and which song on your new U2 CD actually sounds different than the first five A side tracks. Bass me to death or what?

In some ways, *Sun Star* is a new concept. Coloured grids and laser bolt blasts, perhaps not, but any development away from alien obliteration is a somewhat refreshing change.

The dynamic sound effects surfing through the game are there because the game necessitates a complementing rhythm section - it's fast, furious and fun-tastic enough to motivate you into a frenzy of agreeable satisfaction.

It requires quite a degree of skill and aforementioned dexterity and is presented impressively enough on screen to be merited as pick entertainment value. It takes a while to get used to, but the time you spend catching is all part of its enjoyment.

Unlike that of the new U2 material, if you can call it new. But still quite a heap of energy crystals behind next issue's Game of the Month.

See you then.

Game : "Sun Star"
Publisher : CRL Group PLC
Distributor : Ozisoft

Graphics:	88
Music:	91
Sound:	92
Presentation:	86
Playability:	90
Overall:	90

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Define Your Wishes

User Defined Characters, quite a mouthful, isn't it? But that's what UDG stands for. And what are UDG's? JASON BRIGGS explains.

Well, put simply, you get a chance to redesign the C64 character set, and to any shape that you wish. And that, my dear readers, can be extremely handy.

For example, you have seen games that have incredible background props. You know, pictures of hills, houses, trees etc. Well, all of those pictures are created from UDG's. We won't be going quite that far in this article, but we will cover the BASIC steps that will help you on your way.

The first thing that I recommend you do is obtain a character editor. Please make sure that it can generate a list of the decimal numbers for each character, or even generate BASIC lines with DATA statements. If you don't have a character editor then I suggest that you beg, borrow, steal or write one. Because I can assure you that life is made much easier with one. I personally will be using *Ultrafont+* for this article, but this isn't the only good character editor, search around and see what you can find.

(An excellent character editor is available on the Disk Magazine number four, as part of the Graphics Workshop - Ed.)

HOW DO UDG'S WORK?

Now that's a pretty fair question, and I'm afraid the answer to the non-experienced may not make too much sense. But I'll try and make it as simple as possible.

The original CBM character set is stored in a chip, called the Character Rom. The first problem that we strike is precisely that - the characters are stored in ROM that we can't change. So how do we cope with this first snag for the day? Well, we switch the character set from pointer ROM down to RAM.

Then, if you wish, transfer the original character set to the Ram position. And lastly, modify that Ram position with your own characters. Quite simple, isn't it? However it does get a little harder, after all, those are just the basic steps to follow. Now we'll cover all of them in full detail.

DESIGNING YOUR CHARACTERS

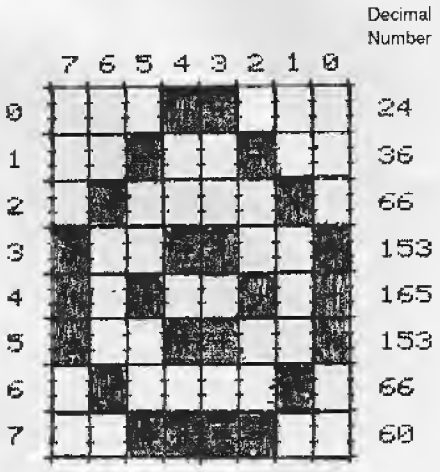
The first thing we will all have to do is design our characters. These new shapes may be anything that you wish. You could turn the 'A' into a face, or modify 'B' into a mushroom. However, for the letters I recommend we try making a new character set. You know, Old English, or even Greek. Once you have decided on your own choice, you have to know how to design these characters.

The easiest way to design character sets is to use a character editor. One that will construct either Basic Data statements, or at least a list of the decimal numbers. I realise that not everyone has one of these niffty little numbers, so I'll cover in brief the design process.

Construct a grid eight by eight, then place on this grid the numbers zero to seven. Please note the order that I have used below. The grid that you have made is called your design grid. Each and every character in the CBM character set is made up of eight pixels across and down. The next step for you to take is to colour in certain blocks that create your desired shape. Once you have done this, we can convert the binary code into a decimal number. Each number that you have written on the top of this grid, represents a bit. And each line horizontally, represents a byte.

If you are not farmilar with converting binary to decimal then refer to the following text: Page 113 *Programmers Reference Guide*, and Page 73 *Commodore 64 User Manual*. These references should put you pretty well in the clear.

Below I have done up a design grid, and worked out the decimal numbers to binary. Just to show you.



MEMORY LOCATIONS FOR OUR CHARACTERS

Now that we know how to design our characters, we have to know were we are going to put them in memory. Well, where can we put them? The answer isn't a simple cut and dried response. You can if you wish, place your new character set in one of three areas of memory. These three possible areas are listed below:

12288 - 14328 or $3000 - $37F8
8192 - 10232 or $2000 - $27F8
2048 - 4088 or $0800 - $0FF8

It is easy to see that a few problems are going to arise with these memory locations. For starters, 2048 to 4088 can't be used at all, if we are programming in Basic. And the other two will take a fair bite out of our Basic Ram, but that's life. If you want the advantage of UDG's, then you have to give up some luxuries. Let's examine these locations one at a time.

12288 - 14328 This area is by far the more desirable of the three, that is when you are programming in Basic. The reason for this is its position. Namely, very high up. Before storing your character sets in memory, we must protect them. This is done by setting the top of Basic pointer to one byte before the character set. (We'll cover this as a separate topic soon.) The thing to remember is that if you use this location area, then you will be left with 10K for your Basic program. And after all, that is usually enough.

8192 - 10232 The second area is not so desirable, in fact if Basic is being used, it will leave you with only 6K. However as a Machine Code programmer will tell you, the more variety the better.

2048 - 4088 The last memory area is absolutely useless unless you are a machine code programmer. Or at least relocate the entire Basic Ram, that however is beyond the scope of this article, so we'll just say the last memory address area doesn't exist for the time being.

TELLING THE 64 WHERE YOUR CHARACTERS ARE

The next step up is to tell the C64 where you have chosen to place your character set. Like many operations on the C64, this may sound difficult, but is done with the greatest of ease. The different commands to point to each memory area are listed below, but don't execute them yet. There's a bit more you need to know.

POKE53272(PEEK(53272)AND240)+12
-This will set the characters at 12288.
POKE53272(PEEK(53272)AND240)+8
- This will set the characters at 8192.
POKE53272(PEEK(53272)AND240)+3
- This will set the characters at 2048.

Well, those are the commands. But what do they do? And how do they do it? These two questions are almost as important as, What happened to Mrs Smith's cat? But I'll answer them any way. (That's the first two I mean, I don't know what happened to Mrs Smith's cat!)

Firstly, how do they do it? Well, if you don't know what POKE, PEEK and AND do, then I suggest you look at Page 35 of *The Programmers Reference Guide.*

What does it do? Okay, it changes and alters the lowest 4 bits in memory location 53272. This is where the C64 gets the information, for where the character sets are in memory.

Let's try using one of these lines - type in the first one and hit [RETURN]. Notice that the screen fills with garbage, (I guess it would be hard not to notice). The reason for this is obvious. There are no character shapes stored up in 12288 to 14328. You will notice that even where spaces were, there is now just garbage. This is because the space is a character too. That information may not seem important to you yet, but it will become important soon. So just remember it.

To get your screen back to normal, just press RUN/STOP and RESTORE, that'll fix it!

TRANSFERRING THE ORIGINAL CHARACTER SET

This brings us to our next topic, that is the original character set. Whenever we carry out the swap commands, (those POKE's listed above) the entire screen fills with garbage. And that's fair enough, because we haven't as yet put any characters into that memory area.

There are two ways to do this.

The first one is to simply stick your new characters into memory, without first transferring the original character set. This method is much quicker, but you may run into problems. For example you would have to redefine the space character, and what if you don't? Well, you may still have your character set, but every space will be filled with garbage. And every character that you haven't redesigned will be garbage. So what does

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all this mean?

The best way for me to explain it is to give you an practical example. Let's say that you needed only two special characters for a program. For the sake of perfection we'll say that we need to redesign the '@' and '*' characters. The problem that we have is this, unless you redesign all of the characters up to and including the space, your screen is going to look very messy. Okay, then we just redsign all of these characters? Wrong, after all that would be a lot of work, just for two characters.

There's an easier way, all we have to do is transfer the original CBM character set down, then place our new '@' and '*' characters into memory. Perhaps I'm not making much sense right now, but I'm sure you will understand soon.

Let us set ourselves an exercise, or let me set an exercise for us. Why don't we start with something simple, like changing the '@' sign into a smiling face. At first this may sound daunting, but it's not. And besides, don't I always make things simple? What do you mean by NO? Well, I do try. So for this example we'll take it one set at a time.

There are some basic steps that you have to take each and every time you wish to customize only one or two characters. These steps are listed below in the correct order.

(1) Transfer the original CBM character set, down into Ram.

(2) Switch the character pointer to the new memory address.

(3) Place the custom characters shape Data into the correct eight bytes of memory.

(4) Exit to program or normal operations.

Those are a broad guide to what you should do, however to make things easier to understand I'll cover each step in detail.

Step number one seems like a good place to start, and what better a way to start than with a program demonstration. The program is followed by a description of what each line exactly does.

```
10 PRINTCHR$(142)
20 POKE52,48:POKE56,48:CLR
30 POKE56334,PEEK(56334)AND254
40 POKE1,PEEK(1)AND251
50 FORI=0TO511:POKEI+12288,PEEK
(I+53248):next
60 POKE1,PEEK(1)OR4
70 POKE56334,PEEK(56334)OR1
```

LINE 10:- The purpose of line 10 is to switch the character set into upper-case. This is just in case you have switched down into lower-case letters.

LINE 20:- Line 20 acts as a

guardian to the characters. What it does is set the top of BASIC to 12287, this is to ensure that your basic programs don't get too large and destroy your character set.

LINE 30:- Now we get into the 'cool' stuff! This line turns the keyscan interrupts off. Or put simply prevents you from terminating the program in mid-flight. The purpose of this is to prevent a total crash, which is what would happen if you did terminate the program.

LINE 40:- This little, but very important line is the code that transfers the CBM character set out of shadow ROM into RAM. However, there seems to be one problem - this line only places the original character set at 53248, how do we get the characters to the area we want? Well that's the job of line 50, so take a little bo-peep at the next line description.

LINE 50:- The purpose of this line is to do the transfer process. It reads the first 512 bytes of the CBM character set, then POKE's them into the correct memory location, namely 12288 onwards.

Please note that it is bytes being transferred, not characters. One character is made up of eight bytes, so this means that line 50 is transferring the first 64 characters. And how do you calculate the number of bytes if you wish to transfer more characters? Easy, just multiply the number of characters by eight. eg. 100x8=800.

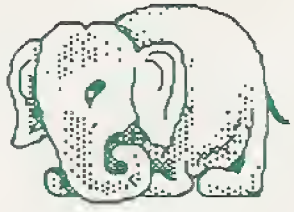
LINE 60:- All this line does is to turn the keyscan interrupts back on. In other words, allows you to enter information back in via the keyboard.

LINE 70:- Switches the CBM character set back into shadow ROM. Then exits the programs.

So, that's what each line does, but what does the program do as a whole? It transfers the first 64 CBM characters into the memory area 12288. And how can we prove this? You could start by running the program. **WAIT!** Don't forget to save it first, for if there is an error in the program, crash! And there'll be no easy way out for most of you. Anyway, back to running the program, there should be a pause of about 20 to 30 seconds. Anything longer then that, and you have troubles.

After the program has been put through its paces, type in the commands that switch the character sets. (That being one of the three POKE lines given previously, we are interested in memory area 12288. So the command will be POKE53272,(PEEK(53272)AND240)+12 and not one of the other two.)

After you enter these commands, we should see, at first, no obvious



difference. But I can assure you, there is a very large difference. Try typing SHIFT-A. Get anything out of the ordinary? Just garbage I hope, because what you have in effect done, is created 64 new UDG's. The only reason why you don't realize this, is because they are exactly the same as the original character set.

Now that is done, let's set about creating our own customized character. That being the smiling face. You may if you wish create your own character and place its DATA in the program. So go off and create your character, and when you come back type in the following program. Use the first one as a base, and just type in the new lines.

```
10 PRINTCHR$(142)
20 POKE52,48:POKE56,48:CLR
30 POKE56334,PEEK(56334)AND254
40 POKE1,PEEK(1)AND251
50 FORI=0TO511:POKEI+12288,PEEK
(I+53248):NEXT
60 POKE1,PEEK(1)OR4
70 POKE56334,PEEK(56334)OR1
80 POKE53272,(PEEK(53272)AND240)
+12
90 FORI=12288TO12295:READA:
POKEI,A:NEXT
100 DATA60,66,165,129,165,153,66,60
```

You will notice that there are three new lines to be entered in. Some of you may have already worked out what they do, but for those of you who haven't then I'll tell you.

LINE 80:- This simply switches the computer from its normal character set, down to our new ones at 12288.

LINE 90:- The purpose of this line is to read our DATA, which is the information for the new character. Then it POKEs that data into the correct eight bytes of memory. Because the '@' sign is the very first character, then it will be located at 12288 to 12295.

LINE 100:- This line contains the DATA that line 90 uses for the new shape.

Once you have worked out what each of these new lines do, then run the program. It may be wise to save it before doing this. When you are presented with the READY. prompt try typing the '@' sign a few times. Surprise, surprise, you are given a picture of a smiling face. Or of whatever shape you designed yourself.

If for some reason you don't get a smiling face, or your own character is distorted, then check your DATA line. Congratulations, you have created your first customized UDG.

SELECTING A CERTAIN CHARACTER

However, what if you didn't want the '@' sign changed, what if you want the '?' to be altered instead? This can be done, and without too much trouble. All it really needs is a bit of basic maths. First you must decide which character to alter. I will, for this example, select the '?' to become a smiling face.

The very first thing we must do is find out what number character it is. This is done by taking a quick look at Page 376 in the *Programmers Reference Guide*. On this page you will find the Screen Display Codes, from there we simply look for our character, then find its number. And a quick glance down at my PRG tells me that the '?' is character number 63.

Once we've got the character number what do we do with it? Easy, multiply it by eight, then add it to the start of the character memory area.

Now that is quite a mouthful, so here is the proper equation:-

Chx8+12288.

Where the Ch is we put the character number. So if we were going to change the '?' into our customized character we would use this equation:

64x8+12288.

And for those of you too lazy to even go for your calculator the answer is 12800. This means that we should start placing our eight bytes of data in at 12800, so if you want proof, alter line 90 to read like this:

```
FORI=12800TO12807:READA:POKEI,A:
NEXT
```

Once you've done that, run the program. Now try typing '?'. You should notice that it is now a smiling face instead of the '@' key. The above method of selection can be used for any character, or characters.

Well, that's about all for this month. Next month I will cover the following topics: multi-coloured characters, redesigning the entire character set without CBM transfer, and a detailed look at using all three memory areas. Bye until next month, and have fun.

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Give Function to your Keys

Ever wished that you could write those nifty little programs that give meaning to your function keys? JASON BRIGGS is going to tell you what's involved - so read on.

Not that it's essential, after all there are many such programs about. But knowing how it is done, and what techniques are used, can be a valuable exercise in programming.

DECIDING WHAT OUR FUNCTION KEYS WILL DO

The first thing you'll have to do before you can even go to your keyboard, is to decide what you want the function keys to do. The obvious thing is the most used commands and keywords. How about RUN [Return], or LIST [Return] and a POKE wouldn't go astray. Anyway, what you decide is up to you and not me. However, for the sake of this article I have chosen my own set. You may if you wish stick to them. I recommend that if you are not too great with machine language, just use my chosen keywords. And what are the chosen ones, well just take a look at the list below.

F1 - RUN [RETURN]
F2 - LIST [RETURN]
F3 - LOAD"
F4 - SAVE"
F5 - POKE
F6 - PEEK
F7 - GOSUB
F8 - RETURN

They aren't very original, but then again neither is the idea of function keys having defined meanings.

Okay, they are the keywords that we want, now how do we go about getting everything to work?

THE KEYBOARD BUFFER

There are two topics that you will have to understand before we can start writing our function key program. These topics are **The Keyboard Buffer** and **Interrupts.** So I have decided to take on the Keyboard buffer first. Pray tell, what is a keyboard buffer?

The keyboard buffer is an area in memory, where we store a list of keys.

These are the keys that you have pressed, but haven't been carried out. If you type out and run the following demo program, you should find this easier to understand.

```
10 PRINT"START PRESSING KEYS"
20 FORI=0TO300:NEXT
```

When you are presented with the message, 'START PRESSING KEYS,' do exactly this. Press as many keys that you can in a two second time limit. Then wait for the program to return to the normal prompt. You should notice that after the READY. sign, there is a number of letters on the screen. And these letters should be the same as the ones you pressed while the program was running. This is what the keyboard buffer does, just stores the keys pressed until the computer can carry out the normal functions

Well, that's the keyboard buffer, but it isn't quite that simple. For starters the keyboard buffer can only store 10 characters at once. So whatever keywords we want to give our function keys, they must all be under ten characters in length. Now then, where is the keyboard buffer located in memory? If you take a look at the table below, you will see.

631-640 or $0277-$0280
- Keyboard buffer.

198 or $00C6
- Number of characters in keyboard buffer.

The second memory address, that is 198, tells the computer how many characters are in the keyboard buffer. The number that you place into this address is the length of the string, plus one. So if you wanted to place LIST into the keyboard buffer, you would POKE 5 into 198. And of course you would POKE LIST into the keyboard buffer itself, starting from 631. The following demo program shows this.

```
10 POKE631,76:REM PUT L INTO KEY/
BUFFER
20 POKE632,73:REM PUT I INTO KEY/
BUFFER
30 POKE633,83:REM PUT S INTO KEY/
BUFFER
40 POKE634,84:REM PUT T INTO KEY/
BUFFER
50 POKE198,5:REM SET KEY/BUFFER
LENGTH
```

If you run this program, you will see that it places the command LIST straight after the READY. prompt. All you have to do from here is press enter. Wouldn't it be really cool if the computer would do that too. Well, why not?

The return key has a value, if you wish to modify the program to do this, then type in the following lines.

```
45 POKE635,13
50 POKE198,6
```

Now run the program, notice how it automatically enters a return value.

What you have just done is the raw basics of a function key program. All you have to do is get the computer to carry out commands similar to these, whenever you press a function key. This is where the interrupts start, it is also where we must leave our basic programmers. I'm afraid there is no way out, interrupts must use Machine Code. Don't feel too disenchanted, try using the Keyboard buffer for other functions. That little exercise wouldn't hurt all of you MC boys (and girls) either.

INTERRUPTS

Well, interrupts. What are they - animal, mineral or vegies? And most important of all, why do we have to use them? The answer to this question stands out like a sore nose.

Now that you know what the keyboard buffer is, and know that you can even place pre-defined key words into it, how do you think we are going to link these operations up with the function keys? It can't be done in a Basic loop, that would leave your computer useless. So how are we going to detect the pressing of a function key, without disturbing the normal operations of the computer? Many of you may have guessed by now. With interrupts!

If you are one of those lords of the computer industry who know about interrupts inside out, then just skip over the next few paragraphs. As for the rest of you, please read on.

Interrupts are the main cause of life in the cosmos. Well, maybe not that important, but they are very important in computers. Your C64, C64c or C128 (I wish Commodore would stop making so many machines) generates an interrupt sixty times every second. If you think about it, that's not a bad turnover, in fact it happens so fast you don't even notice. So all we have to do is get the computer to go through our function key routine, before the normal Kernal Rom routines. This is quite easy, that's if you follow the steps below.

(1) Redirect the interrupts to your F-key routine.
(2) Instead of exiting your routine with a

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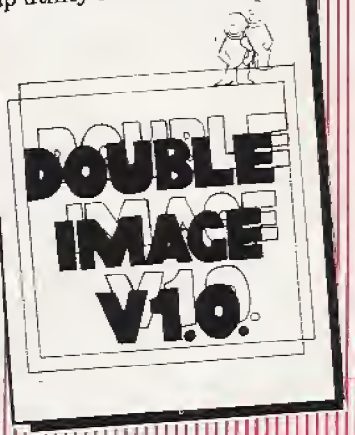

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RTS, always use JMP $EA31.

And that's that, or don't you know how to redirect the interrupts? Well, I will tell then. The hardware interrupts are controlled by two pointers. These pointers naturally point to where in memory you can find the Rom interrupt routines. So all you have to do is change the pointers to direct the interrupts to the function key program.

The hardware interrupt pointers, which are located at 788 and 789, operate in the normal 6510 format. That being low/byte, high/byte format. So if you wanted to point the hardware interrupts at $C000, then $00 would go in 788 and $C0 would go into memory address 789.

But don't do that from Basic, or even machine code yet. There are a number of other little tricks you have to know about.

If you are interested in learning more about interrupts, then look at an article called 'Raster Graphics' in the April edition of the *Australian Commodore Review*.

Once you have redirected the interrupts, you have to have a routine there. After all it does help if the computer isn't caught in an endless loop!

Anyway, this routine can be almost anything you want, in this case it will be a function key routine. These programs are written in the same way as normal, except that we don't end them with RTS. It has to exit to the normal Kernal Rom routines, that is a $EA31. So all you have to do is put in a JMP $EA31 at the end of your program.

A PRIMITIVE FUNCTION KEY PROGRAM

So what does all this mean? It means that you can now write a function key program. Just follow the steps below and you can't really go wrong. Or can you?

The setting up routine.

(1) Turn the hardware interrupts off using the SEI command.
(2) Redirect the hardware interrupts to the new routine.
(3) Turn the hardware interrupts back on using the CLI command.
(4) Return the computer to normal operations, by using the RTS command.

The function key routine.

(1) Check to see if a function key has been pressed, and if so which one.
(2) Jump to the correct area of the program that handles each particular function key.
(3) At this small sub-routine, you will place the key word into the keyboard buffer, and the length into the memory address 198.
(4) Exit out of the function key program, to the normal interrupt routines.

And that's it, not really very complicated is it. In fact you could quite easily do up one of these programs in a flash. That just so happens to be what I've done. The following programs were written using the Commodore Assembler Development Kit. However, this format may also be converted with considerable ease to another assembler kit. Something like Champ, or at least along those lines.

If you enter in this modest looking program below (**Figure 1**), you will have yourself a function key routine. Once you have it up and running, (to activate use SYS49152) just press F1. What the program should do is print the abbreviation for LIST, followed by a [RETURN] value. Well, what can I say. The demo below is really all there is to it, but you could make the program a little cleaner than it is. And besides, this particular routine only checks for the F1 key, why not check for all eight. Don't forget to use your assembler for all it's worth.

Check out the proper demo program that I've given you on page 22 (**Figure 2**).

Well, Figure 2 is quite a mouthful, isn't it? I just spent one and a half hours doing that up for you! Now what you have to do is dissect it. I have put in a few remarks, just to help you along.

There are a few things that you had better note, the first being in the LOAD" and SAVE" routines. Notice that the value placed into memory location 198, is in fact the same as number of characters. The reason why we don't add one onto these keywords, is because they end with a " character.

The second note is that I have only put remarks on one sub-routine; the rest are exactly the same, except for different values and addresses. What's that? Yes, for your information, I am lazy.

The last thing is about how you activate the program. Don't use SYS49152. The command to run this program is SYS49235 [RETURN]

That's about all the help I can really give you. The rest lies in your lap. As with many things in life, you only get out of your computer what you put in. Anyway, have fun, and see you next month.

Figure 1

```
1000     *=$C000
1010     SEI      ;TURN IRQ OFF
1020     LDA #<start ;NEW VALUE FOR THE LOW/BYTE OF POINTER
1030     STA $0314  ;
1040     LDA #>start ;NEW VALUE FOR THE HIGH/BYTE OF POINTER
1050     STA $0315  ;
1060     CLI      ;TURN IRQ BACK ON
1070     RTS      ;RETURN TO THE NORMAL OPERTIONS
1080 START  JSR $FF9F  ;JUMP TO KERNAL ROM ROUTINE - GET KEY VALUE
1090     LDA $0277  ;
1100     CMP #$85   ;CHECK THE KEY VALUE
1110     BEQ F1     ;IF IT IS F1 THEN JUMP TO F1
1120     JMP $EA31  ;OTHERWISE EXIT ROUTINE
1130 F1    LDA #$4C   ;
1140     STA $0277  ;PLACE 'L' INTO KEYBOARD BUFFER
1150     LDA #$69   ;
1160     STA $0278  ;PLACE SHIFT-L INTO KEYBOARD BUFFER
1170     LDA #$0D   ;
1180     STA $0279  ;PLACE [RETURN] INTO KEYBOARD BUFFER
1190     LDA #$04   ;
1200     STA $C6    ;SET LENGTH OF KEYBOARD BUFFER TO 4
1210     JMP $EA31  ;EXIT ROUTINE
1220     .END
```

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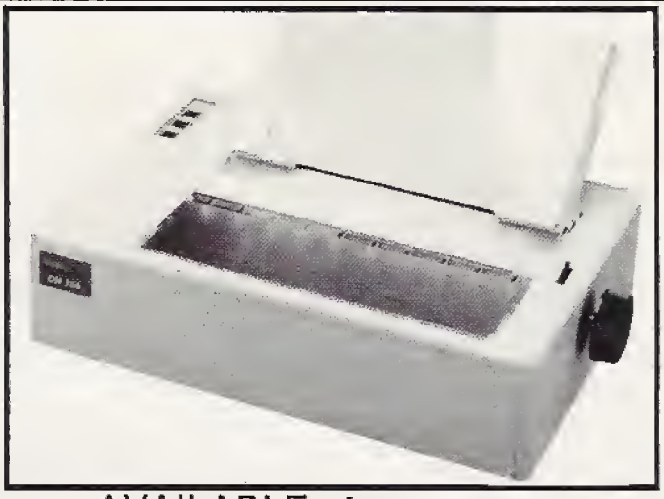

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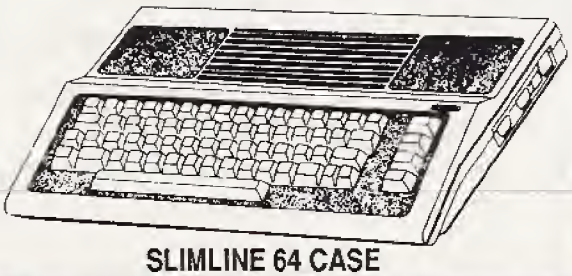

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Figure 2

```
1000        ;*****************************
1010    ;*   COMMODORE 64      *
1020    ;*    F.KEYS V1.0      *
1030    ;*---------------------*
1040    ;*   JASON BRIGGS      *
1050    ;*   MACKAY - QLD      *
1060    ;*   14TH APRIL        *
1070    ;*     1987            *
1080        ;*****************************
1090    *=$C000
1100 RUNV   .BYT $52,$75,$0D
                              ;THESE ARE THE
1110 LISTV  .BYT $4C,$69,$0D
                              ;ASCII VALUES
1120 LOADV  .BYT $4C,$6F,$22
                              ;FOR ALL OF THE
1130 SAVEV  .BYT $53,$61,$22
                              ;KEYWORDS USED.
1140 POKEV  .BYT $50,$6F
                              ;
1150 PEEKV  .BYT $50,$65      ;
                              PLEASE MAKE SURE
1160 GOSUBV .BYT $47,$4F,$73
                              ;THAT THEY ARE CORRECT
1170 RETURN .BYT $52,$45,$74
                              ;
1180 TITLE  .BYT $93,'      *** F.KEYS V1.0 ***'      ;THIS IS THE
1190        .BYT  $0D,'    BY JASON BRIGGS',$0D,$0D,00  ;TITLE
                                                        SCREEN
1200        SEI               ;TURN OFF THE IRQ
1210        LDA #<START       ;NEW LOW/BYTE VALUE FOR THE
                              POINTER
1220        STA $0314         ;
1230        LDA #>START       ;NEW HIGH/BYTE VALUE FOR THE
                              POINTER
1240        STA $0315         ;
1250        CLI               ;TURN IRQ BACK ON
1260        LDA #<TITLE       ;
1270        LDY #>TITLE       ;PRINT THE TITLE SCREEN
1280        JSR $AB1E         ;
1290        RTS               ;RETURN TO NORMAL OPERATIONS
1300 START  JSR $FF9F         ;
1310        LDA $0277         ;GET THE KEY VALUE FROM
                              KEYBOARD BUFFER
1320        CMP #$85          ;
1330        BEQ F1            ;IF F1 THEN GO TO RIGHT ROUTINE
1340        CMP #$89          ;
1350        BEQ F2            ;IF F2 THEN GO TO RIGHT ROUTINE
1360        CMP #$86          ;
1370        BEQ F3            ;IF F3 THEN GO TO RIGHT ROUTINE
1380        CMP #$8A          ;
1390        BEQ F4            ;IF F4 THEN GO TO RIGHT ROUTINE
1400        CMP #$87          ;
1410        BEQ F5            ;IF F5 THEN GO TO RIGHT ROUTINE
1420        CMP #$8B          ;
1430        BEQ F6            ;IF F6 THEN GO TO RIGHT ROUTINE
1440        CMP #$88          ;
1450        BEQ F7            ;IF F7 THEN GO TO RIGHT ROUTINE
1460        CMP #$8C          ;
1470        BEQ F8            ;IF F8 THEN GO TO RIGHT ROUTINE
1480        JMP $EA31         ;EXIT TO NORMAL KERNAL ROM
                              ROUTINES
1490 F1     JMP F1A           ;
1500 F2     JMP F2A           ;
1510 F3     JMP F3A           ;
1520 F4     JMP F4A           ;
1530 F5     JMP F5A           ;
1540 F6     JMP F6A           ;
1550 F7     JMP F7A           ;
1560 F8     JMP F8A           ;
1570 F1A    LDX #$00          ;CLEAR THE X REGISTER FOR COUNT
1580 F1B    LDA RUNV,X        ;GET CHARCTER FROM KEYWORD
1590        STA $0277,X       ;PLACE CHARACTER IN KEYBORAD
                              BUFFER
1600        CPX #$02          ;CHECK TO SEE IF IT IS THE END
1610        BEQ F1C           ;IF SO THEN BRACH
1620        INX               ;OTHERWISE ADD ONE TO COUNTER
1630        JMP F1B           ;REPEAT THE PROCESS
1640 F1C    LDA #$04          ;PLACE IN THE NUMBER OF
                              CHARACTERS +1
1650        STA $C6           ;INTO MEMORY ADDRESS 198
1660        JMP $EA31         ;EXIT TO NORMAL KERNAL ROM
                              ROUTINES

1670 F2A    LDX #$00
1680 F2B    LDA LISTV,X
1690        STA $0277,X
1700        CPX #$02
1710        BEQ F2C
1720        INX
1730        JMP F2B
1740 F2C    LDA #$04
1750        STA $C6
1760        JMP $EA31
1770 F3A    LDX #$00
1780 F3B    LDA LOADV,X
1790        STA $0277,X
1800        CPX #$02
1810        BEQ F3C
1820        INX
1830        JMP F3B
1840 F3C    LDA #$03
1850        STA $C6
1860        JMP $EA31
1870 F4A    LDX #$00
1880 F4B    LDA SAVEV,X
1890        STA $0277,X
1900        CPX #$02
1910        BEQ F4C
1920        INX
1930        JMP F4B
1940 F4C    LDA #$03
1950        STA $C6
1960        JMP $EA31
1970 F5A    LDX #$00
1980 F5B    LDA POKEV,X
1990        STA $0277,X
2000        CPX #$01
2010        BEQ F5C
2020        INX
2030        JMP F5B
2040 F5C    LDA #$03
2050        STA $C6
2060        JMP $EA31
2070 F6A    LDX #$00
2080 F6B    LDA PEEKV,X
2090        STA $0277,X
2100        CPX #$01
2110        BEQ F6C
2120        INX
2130        JMP F6B
2140 F6C    LDA #$03
2150        STA $C6
2160        JMP $EA31
2170 F7A    LDX #$00
2180 F7B    LDA GOSUBv,X
2190        STA $0277,X
2200        CPX #$02
2210        BEQ F7C
2220        INX
2230        JMP F7B
2240 F7C    LDA #$04
2250        STA $C6
2260        JMP $EA31
2270 F8A    LDA #$00
2280 F8B    LDA RETURN,X
2290        STA $0277,X
2300        CPX #$02
2310        BEQ F8C
2320        INX
2330        JMP F8B
2340 F8C    LDA #$04
2350        STA $C6
2360        JMP $EA31
2370        .END
```

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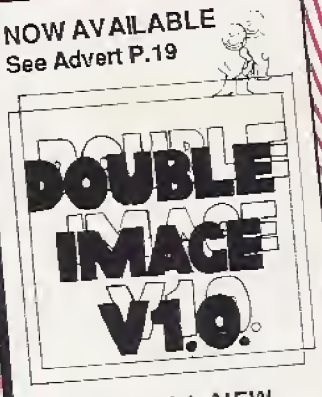

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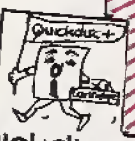

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"Freeze Frame" can be brought into operation at any convenient point by **pressing the button** on it. You can then do one of three things –

1. **Pressing "D" will save a working version of the program in memory to a formatted disc. This version will include an auto booting very high speed reload (many programs reload in less than 30 secs).**
2. **Pressing "S" will save a completely standard version to disc, ideal for use with your fast load cartridge or system. Use with "Dolphin DOS" to load any program in 10–15 seconds. Also compatible with non CBM drives and U.S. spec. computers.**
3. **Pressing "T" will save a working version of the program in memory to tape. This incorporates a high speed reload at approx. 2400 baud.**

IT'S AS SIMPLE AS THAT

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SERIOUS WARNING: THIS IS AN EXTREMELY POWERFUL PRODUCT AND IS STRICTLY FOR PERSONAL USE. DON'T COMPARE IT WITH ANY OTHER PRODUCT, NOTHING ELSE OFFERS THE POWER OF "FREEZE FRAME".

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Customers with earlier versions may return them along with a payment of [ ] to receive V5.0.

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STOP PRESS!!

Many software houses are now using "Anti-Freeze" in their software. This renders ordinary back-up cartridges useless. We are now shipping "Freeze Frame Mk. 3B" which will deal with these programs. As far as we know other competitive devices will NOT. Most new software will be using this so don't forget if you want results you must buy "Freeze Frame".

Owners of Mk. 3 wanting Mk. 3B can upgrade for **$25.00**

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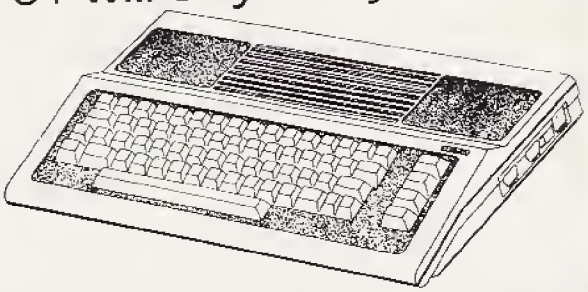

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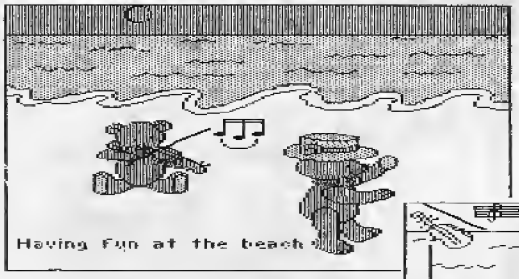
TEDDY BEAR-RELS OF FUN



by Eric Holroyd

The caption on the box of this delightful program declares "for people of all ages", and if the widely-varying age-groups attending Sydney's annual Teddy Bear's Picnic in Wentworth Park are anything to go by, it's probably true.

Everyone seems to have had a Teddy Bear at one time or another and if they've now graduated to micro-computers they could combine the two things and play with both toys at once. Either that or let the kids have the computer to themselves for a while and let them play.

This nice piece of software lets you create pictures of Teddy Bears in a variety of situations using props, backgrounds and settings in a sort of "mix and match" style, then add text to the picture either as a "speech balloon" in cartoon fashion or as a caption to the picture. Having done all this you then have the option to print the picture in several different ways: half-page picture, full-page picture, 4-page poster (you paste the pages together to form the poster) or as a standard 4" sticky label which takes the bottom half of the picture to make the label. They're good printouts and the program supports a range of popular printers.

The label option is very handy for making personalized labels for books and records etc and in the label-making mode the screen is marked off to show you the portion to be used in printing your label so that you can properly plan it.

It's a two-disk set, the second disk being a data-library of extra Teddy Bears and "clip-art" bits and pieces and the two disks together give a huge range of options. There are small Teddy Bears, medium Teddy Bears and large Teddy Bears, backgrounds for all four seasons, as well as "beach" "windy day" and "lake" settings. There are props to use in varying situations like "picnic", "beach" , "outdoor" etc, and you can add grass, clouds, sidewalks etc to the picture as you build it. Then there are even more Teddy Bears in "acting" and "performing" poses, Teddy Bears in silly hats, and a further section where you can play at dressing Papa, Mama or Baby Bear in a selection of clothes provided.

The various Teddy Bears, props and other bits of clip-art are selected from actual pictures rather than descriptions, so you see exactly what you're adding to your picture. Once selected you move the item around the picture with the cursor keys and when it's in the right spot you press Return to "drop" it in place. Very easy and the younger folk will love playing with this one. You can of course erase a piece if you make a mistake and it's all very nice and creative. To round off the picture you have a choice of 10 different borders, including Butterflies, Music, Flowers and Leaves, Balloons etc, plus seven fonts in varying sizes so the combinations of actors, props, backdrops and other decorations is virtually endless.

The software is menu-driven and can be operated almost without reference to the manual when setting up the various options, although you'll use the last chapter a lot when setting up your pictures. It has around 15 pages, is called "Teddy's Graphics Quick Reference Guide", and it shows every graphic available. It also has some good suggestions for pictures, labels and signs to help you get started. In my view this is how good software should be presented, nice easy-to-follow menus with a good manual to refer to when you find it necessary. The manual helps a lot also when setting up your printer with helpful hints on such things as interfaces and linefeeds etc and takes you through the process of setting up a data disk for storage of the pictures you create so that you can use them again and again.

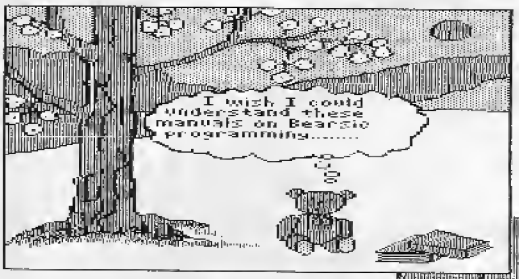
An especially nice touch is the facility to make what they call "an Electronic Show" which is an automatic slide-show displaying up to ten of your pictures in a sideways scrolling sequence. To make this slide-show you select "Initialize a Data Disk" from the data disk menu and the program formats the disk and puts the slide-show boot program on it too. You then create your pictures and save them to the disk as you make them, and when it's all done you sit back to watch your slide-show. This is a great feature for making animated nursery rhymes or other kid's stories and could be a great teaching aid if used in say a sequence teaching Road Safety with Teddy Bears looking both ways before crossing etc.

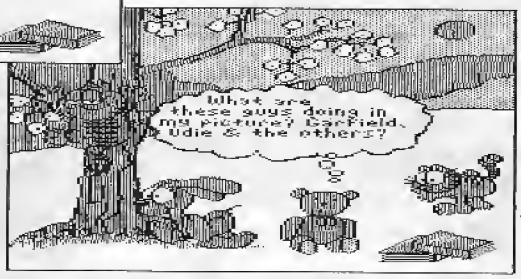
To load the slide-show you must follow the instructions and load '",8 and not '",8,1. This bit is important as the slide-show boot program will only run if loaded properly. I found this out by not reading the instructions myself so I thought I'd pass it on. When all else fails, read the book!

One of the examples in the manual shows a boatload of Teddy Bears dressed as pirates with the lookout bear saying in a speech balloon "There's land ahead, Captain" and a story-line caption at the bottom of the picture saying "The sailing bears were all at sea one sunny day, when all of a sudden . . . " This looks like a great opening shot for another nine pictures of a pirate tale which the kids would enjoy.

On top of all this you can make your

SOFTWARE REVIEW





own Special Artwork with a Koala Pad and save it to your data disk, to be loaded in when required and used with the existing artwork. If you do this, of course, your work is entirely your own and no one else can possibly make a picture exactly like yours.

The program originates in the USA and is published by Developmental Learning Materials of Allen, Texas (just say the title *Teddy Bear-Rels of Fun* out loud to check how your American accent is coming along!) and is part of a long list of educational software packages covering Math/Problem solving, Geography, Computer Literacy, Language Arts, Early Childhood, Creative Arts etc etc. It's in this last category that *Teddy Bear-Rels of Fun* falls.The accompanying material says: "Just imagine the fun of creating Teddy Bear stories, pictures, posters, labels, stickers etc with this unique new software program. Children will love it, parents and teachers will too!" The program encourages creative thinking, writing and artistic skills as well as giving practice in spelling and vocabulary skills to younger folk.

As there are over 200 separate pieces of art, plus borders and a variety of fonts, there's tremendous scope for invention and creativity. Over 30 printers are supported, including the latest colour printers. Your printouts can be done either "filled in" or in "outline" only. This latter facility is great for making your own colouring-in books, handy for youngsters on those rainy days!

The leaflet also mentions a Teddy Bear-Rels of Fun Activity Booklet which shows how to make patterns for craft projects such as paper dolls, needlepoint, knitting, crocheting, applique and stencilling. All in all it's a good-value program for almost any age-group and is available for the Commodore 64 at $62.31 ($54.95 excluding tax where applicable) from good stockists everywhere.

Teddy Bear-Rels of Fun is distributed in Australia by: Dataflow Computer Services, 134 Barcom Ave, Rushcutters Bay, NSW 2011.Ph:331-6513

Australian Commodore Review

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SOFTWARE REVIEW

Create with Garfield!

Deluxe Edition

by Eric Holroyd

This program was originally released in 1986 and has now been re-released with the 'Deluxe' tag. The new version has several enhancements over it's predecessor including improved printer drivers and the very handy option to return to the previous screen you worked on by pressing CRTL/C.

The program itself has a lot in common with *Teddy Bear-rels of Fun.* It's from the same company and is very similar in operation. If you and the kids have learned one program then you can operate the other one, it's that simple.

Basically, this is a program to create and print posters, pictures, stickers, labels etc. for printing on a variety of printers **including colour printers.**It offers over 200 pieces of artwork, including borders, and has several typefaces (or fonts) for writing captions or stories.

There's also the same facility as in *Teddy Bears* to make a continuously moving slide-show of your pictures which then scroll sideways across the screen and which is great for making your own comic cartoons and stories.

Garfield can have his friends with him in the pictures, including Odie and Jon, and there's a good selection of 'poses' available of all the characters. There's also a set of pre-programmed captions within this program, or of course you can make up your own. The accompanying leaflet with my review copy said that there's a Garfield Activity Sheet included to help you get started with ideas, and you'll soon think up dozens more uses of your own.

The list of printers is apparently common to both *Create With Garfield (Deluxe Edition)* and *Teddy Bear-rels of Fun* and consists of:

CBM 801 CBM 803 CBM 1000 CBM 1525
C. ITOH PROWRITER GORILLA BANANA (what a name!)
OKIDATA 84 OKIDATA 92 APPLE DMP
EPSON FX-80 EPSON FX-85 EPSON MX-80
OKIMATE 10 (BLACK & WHITE)
OKIMATE 10 (COLOUR)
C. ITOH 8510 (BLACK & WHITE)
C.ITOH 8510 (COLOUR)
OKIDATA 292 (BLACK & WHITE)
OKIDATA 292 (COLOUR)
EPSON JX-80 (BLACK & WHITE) EPSON JX-80 (COLOUR)

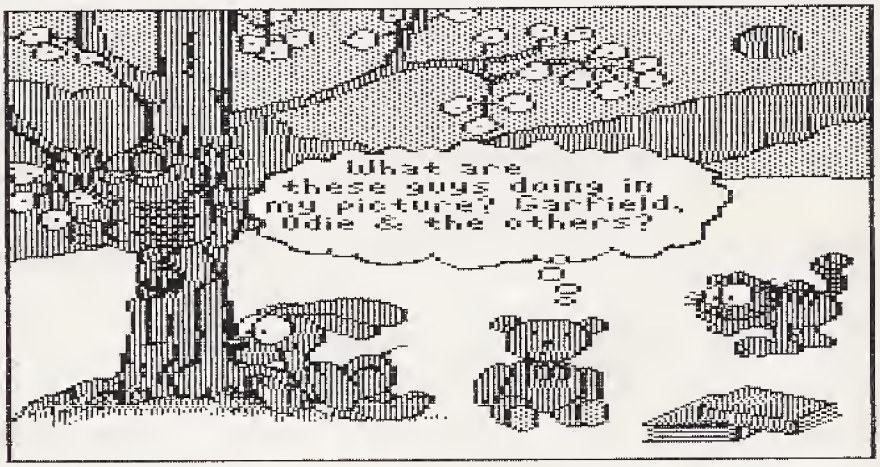
Interfaces supported are:
BATTERIES INCLUDED CARDCO G-WIZ
CARDCO 'CARD? CARDCO 'CARD?' +G

I have a Star Gemini 10x printer coupled with a Xetec Super Graphics Senior interface and I found that it worked fine if I set the printer definition as CBM 1525 and said 'No' to linefeeds.

It's always a matter of trial and error to set up a printer as no software company can possibly cover all of the hundreds of printers on the market, so what they do is cover the main ones, knowing that other brand printers will most probably work using one of the printer drivers listed in the program. If in doubt consult your printer manual or your printer supplier.

The printouts cover pretty much the same range of options as does *Teddy Bears,* including 'outline' or 'filled in', and it was this and other similarities in operation that prompted me to experiment with the possibility that the two library disks might be interchangeable. To my delight they were, and I was soon making Garfield pictures with Teddy Bears in them and vice versa. I even tried mixing the graphics from the two master disks and they worked too! So, if you buy both programs you can do all that yourself and mix up all the characters any way you like and make some very interesting picture-stories and cartoons etc.

My only gripe with the Garfield printouts was the fact that it puts a credit line in small print at the bottom of the picture saying 'C. United Feature Syndicate 1978' and I didn't think that they should claim copyright on something which I'd just created! I realise, of course, that they're claiming copyright on the Garfield character due to the strict licensing arrangements, but due to my experimentation with swapping the library disks I found a way to eliminate that one. I just used the Teddy Bear printout mode, it doesn't have the copyright line on its pictures!



If you're a Garfield fan (and who isn't?) then you'll like this one as much as the Teddy Bears, so why not add both programs to your software library? The added bonus of mixing and matching the two will give endless hours of fun for you, your family and your friends.

Available for Commodore 64 at RRP $62.31 ($54.95 excluding tax where applicable) at good stockists everywhere.

SOFTWARE REVIEW

Artist 64

Although not the most elegant of programs, Artist 64 is by far the most sophisticated and supposedly out-performs any other Commodore graphics package. Andrew Farrell put it to the test to see if these claims were indeed true.

As a rule all graphics packages have their strengths and weaknesses. *Artist 64* is no exception, although it does boast some very smart features unlikely to be found elsewhere.

Our review copy was a pre-release version and thus we only had a tatty photocopied manual to guide us on our adventure into the various menu screens.

Ideally the program requires the use of the MS2000 or NEOS mouse, however a joystick will suffice. Two disks are included, one of which contains the main program itself, the other a selection of utilities, demonstrations and example pictures.

For a guided tour of the program's capabilities, it's best to load up the included demo. This will take you through some of the more interesting options as if someone were actually operating the software for you.

Main Menu

The main menu is divided into two sections; one of which controls the colour palette, the other, the various drawing commands. This display is complex looking and could be a great source of confusion for those more familiar with the structured layouts of programs such as *Micro Illustrator* and *Blazing Paddles*. *Artist 64* is more along the lines of a super version of *Doodle* - minus those useful help screens.

The documentation deals with each command individually, with continual reference to the use of a mouse. Each command is effected by a variety of other commands in a hierarchal fashion. This forms a massive web of complex commands and options that serve only to boggle the mind and leave most users with three left hands and four right thumbs.

In short, this is my greatest complaint; whilst the power is there, getting at it is a little tricky at first.

Some options may be toggled or switched on or off. Various other paramiters are adjustable, such as the RCP or Remembered Cursor Position. At first, facilities like this may appear to be nothing more than a burden to deal with, however the manual assures us that this option is useful for concentric circles, lines radiating from a point, accurate positioning of text (be it horribly chunky and very unstylish) and accurate definition of starting points for block copying.

Basic functions include line, free hand, ellipse, rectangle, triangle, and set colour for ink/paper/border. There's also an invisible grid option and a very smart magnify facility.

A small knowledge of geometry is useful in deciphering the manual, which delves into the world of polygons, axis of symmetry and the elusive rubber band mode. In short, a polygon is a circle with square edges or an elipse with symmetrically square edges.

Rubber.Banding is an effect used to place a two dimesional shape in its correct position prior to drawing the final design onto the work screen. Until you press the button the shape in question stretches as if made of rubber, into whatever positions you desire.

Text

It is possible to print text on the screen in a variety of sizes from 5 x 5 to 160 x 200 dots or proverbial pixels (the default size is 8 x 8). As with most programs of this nature, the larger versions of characters are produced by magnifying the smaller versions. The result is ghastly but adequate.

The limited memory available to the 64 makes it impossible to store a decent variation of fonts in a range of point sizes. (*GEOS* overcomes this problem by loading fonts from disk, as they're required).

Your words may appear

horizontally, vertically or italicised.

Special Effects

Artist 64's greatest asset is its ability to deal with colours and brushes.

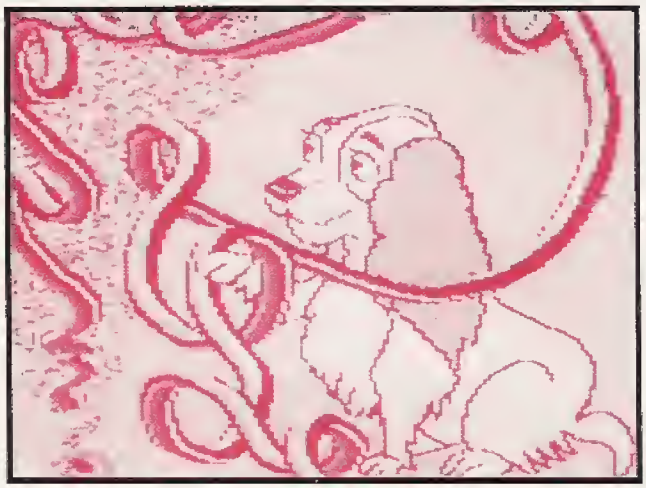
From the special effects menu this program really comes to life, taking what up until now is a run of the mill drawing package into the realms of *Deluxe Paint*, of which Amiga owners will be familiar. Colour priority, cycling and block copying as well as definable patterns and brush shapes make it possible to create some incredible effects.

It is possible to cut out part of your drawing and use it as a brush. The way in which the colours overlap may be modified through use of the protect command. Certain colours may be made to filter through whilst others are ignored. This is very useful for creating incredible 3-D effects, as background figures may be added without erasing your foreground. You may design your own fill patterns in a similar fashion.

Colour cycle allows you to select any of the 16 available colours to be cycled as you paint, at a rate whch is variable. This facility works with circles, free hand and polygons drawn, creating instant patterns that would otherwise require much fiddling.

Various other features include user definable windows where you can limit the drawing window to any size of your choice; sprites or brushes may be flipped horizontally or vertically; two screens may be held in memory at once - use the second one as a scratch pad; new shades of colour may be created using multi-colour sprites and your masterpieces can be stored to disk or tape and be printed on MPS 801/803/ 1525/Epson Printers.

Entering text may be done using the mouse, or after disconnection of any such fluffy creatures, the keyboard. This option did seem to be a little moody, but that may have been my fault. Occasionally it seemed the keyboard refused to work and then, when it finally did, the keyboard buffer emptied itself out, spewing spurious characters into the input area.



Programs are included on disk to load and display *Artist 64* pictures from within your own BASIC programs. There's also a routine to read the mouse and associated buttons.

"... a small knowledge of geometry is useful..."

Conclusion

Whilst lacking the sharp presentation of *GEOPaint* and the ease of use of *Micro Illustrator*, *Artist 64* is without doubt the most full-featured drawing program available.

It suffers from some cumbersome facets of its menu operation such as having to switch to a separate menu in order to execute the UNDO command.

A mouse is an essential addition, although it can be managed without.

Ian Bradbury and Rhys Davies have taken a new approach to the 64's graphic abilities and managed to stretch them that little bit further - a job well done.

The package is a worthwhile purchase especially for existing owners of the aforementioned mice.

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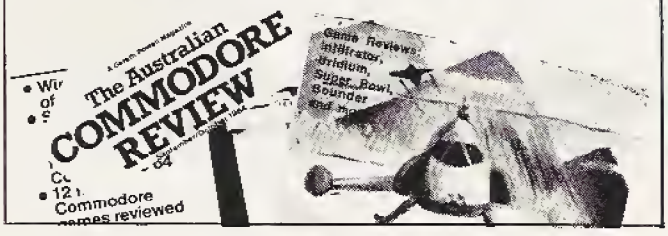

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SOFTWARE REVIEW

Electrosound 64

by Eric Holroyd

This is a powerful synthesizer/sequencer/music/entry/programmable drum machine program which comes all on one disk from Orpheus Software (UK).

Musical compositions produced with the software can be saved to disk or tape for future replay or modification and there's an impressive music demonstration supplied with the software which ranges from classical music through funky jazz to rock'n'roll.

By running the demonstration tracks you can get a pretty good idea of the way *Electrosound 64* stores its music as there's an excellent screen display of what's happening in the various tracks at all times.

Electrosound 64 uses the three channels of the Commodore 64 to their best advantage and even if you've already dabbled in synthesizers, you won't be disappointed in the sounds you can produce with this software. If you don't know anything about them then this is an ideal program to start your learning with as it comes complete with 50 preset sounds; 10 of which are nothing to do with music but are purely 'sound effects,' like Machine Gunfire, Gas Attack and Sea Shore. By running these sounds and examining the panel on screen, you can find out how these exciting sounds are made and then create your own and store them on disk or tape for posterity.

You can play the Synthesizer manually using the C-64 keyboard, or if you have one of those plastic keyboards (part of the Commodore Music Maker Package) that clips onto the C-64 then you're in luck because *Electrosound 64* is compatible with that too. You use this Manual Play method also when entering your own music into the program's Sequencer. In this mode you can create music in three parts complete with tempo changes, a feature not found in too many other programs, plus you can change the sounds being used in any Channel at any time.

To play a Track the controls have been set to simulate an ordinary cassette player and represent: B=Stop, N=Play, M=Pause, <=Rewind and >=Fast Forward. Very clever and very handy too. All you do to play a pre-recorded Track is load it up by following the menu prompts, then use those controls to play all or any of the Track from any point. Great when you need to edit music too!

The control screen itself shows a 2-"octave piano keyboard' with the note names shown above a chart of the 64 keyboard keys which represent those notes. Nice and easy to read, as is the method of showing which Channel has what sounds stored in it and whether the Filter is "on" or "off" on a Channel.As the music plays, the "piano" notes being played show black dots to indicate the note(s) with "spade" symbols to show drum sounds and it's quite fascinating to watch as well as listen to. There's a large grey panel in the centre of the screen below the "piano keyboard", which shows the entire Sequence being played, complete with all rests (musical spaces) which make up the composition.

Incorporated into *Electrosound 64* is a programmable drum machine which you can use at the same time as the music sounds to provide drum accompaniment to your composition and give it rhythm. By checking the screen display of the Sequence you can slot in the drum sounds in any available spots in any of the Channels and some great effects are possible. There are 24 drum and percussion sounds built into the software to help you get started.

I'd said above that the "piano keyboard" display shows two octaves, and by using a simple switching method the authors have ensured that you can use this keyboad to play a full 8-octave range (about the same range as a full-size piano). Also included is the facility to "transpose", or change the music to another key simply by following the instructions (which tell you to use the Function Keys in a particular sequence) and it's all very easy. In fact the programmers say in the foreword that the program was written "for use by people of varying musical knowledge" and I can see that it would be useful to novices as well as experienced musicians.

When entering your own music, you first of all enter it into a Sequence one voice at a time, and then store the Sequence on disk or tape. A Sequence allows musical notes and drums to be played in three Channels at the same time. It's an idea to have Channel 1 playing the "lead" or melody of a tune with perhaps Channél 2 playing an accompanying voice line and the bass line in Channel 3. As I said above, you can put drum sounds into any of the Channels wherever there's a spare slot.

All of this is much harder to explain than it is to actually do (like so many other aspects of computing!), but you'll find that the instruction book is a great help and explains things in a step-by-step manner which makes it fairly easy to grasp everything.

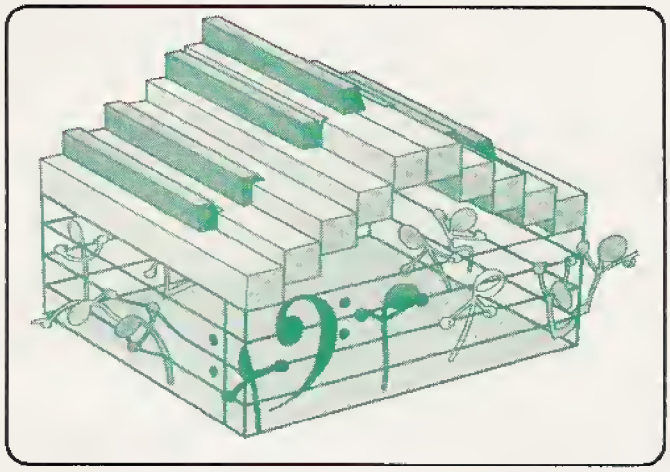
There are 20 Sequences available plus 20 Tracks. A Track is made up from Sequences and can hold a maximum of 100 Sequences (very handy because most music has passages which repeat one or more times). When setting up your Track you simply say in what order you want the Sequences to be played and if the first bit of the song is repeated after the fourth bit you specify that order. In other words, you don't have to rewrite the first bit, you just call it up to be played again. Great! Make the machine do the work!

A Sequence can store up to 240 "Steps" in each of three Channels and it scrolls across the screen in Subsequences which are anything from 1 to 16 Steps long. A Sub-sequence can usually be thought of in terms of a "bar" or "measure" of music but this can be varied

according to the tempo setting. This feature makes composing possible in any time-signature, whether Waltz, Rock number, March or Greek Dance etc. Some other music programs don't offer this feature.

The Synthesizer mode allows vast scope for experimentation and the manual takes you through the method of creating a sound by changing one of the existing sounds to unleash your creativity. A nice touch here is that there's a "write-protect" feature which you need to unlock before you're allowed to change the parameters of a sound. This, of course, prevents you from changing a sound unintentionally.

You're taken through the mysteries of Attack, Sustain, Delay and Release (known to synthesizer aficionados as ASDR), where all is explained and made clear and the author of the manual, having given you the basics of sound synthesis, encourages you to experiment! You'll learn about Ring Modulation and Filters and other mysteries if you work though the instruction manual which, surprisingly enough for something so comprehensive, is only about 30 pages long including the very helpful Command Key Charts.



This program has been around for almost two years in Europe and the UK and if you've seen some of the "demo" programs made by the Compunet fans then you've certainly heard a lot of music that's been produced by *Electrosound 64* as it's used on a lot of those demos.

The program itself doesn't come with a compiler but there is one available, written by one of those self-same Compunetters and which lets you make "stand-alone" music (you don't need to re-load *Electrosound 64* to run these compiled files) which you can play by itself or from within your own programs. User groups should be able to help with this Electro Compiler or you could drop me a line care of this magazine for more information. If you do drop a line, tell us what you think of the magazine and its contents, we really would like to know how you like it.

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Amiga Column

by Tim Strachan

Word processing and desktop publishing

The original main use of personal computers was word processing, and so it remains, in spite of the explosion of program genres of all kinds. Word processing itself has gone through a number of rapid developments, from the first key-combination controls (as *Wordstar* for the IBM still is) to mouse- and menu-driven WPs such as are available for the Amiga.

And word processing has moved on to Page Processing and Idea Processing - in other words, Desktop Publishing. All of these are fairly vague terms and they overlap a lot. They overlap so much in fact that you can now set up a seamless publishing system on your Amiga, as I'll describe.

There are a number of WP packages available for the Amiga and the list is growing. The best known are *Textcraft* (provided with the Amiga) and *Scribble!*, but there are also *Wordwright*, *E.T.Writer* (which turns the Amiga into a full-featured electronic typewriter), *Talker* (which speaks as you type!), *VizaWrite*, *Write Hand*, and a couple of others unavailable in Australia.

Most of us have used *Textcraft*, and have formed opinions about it - it does the job with some unnecessary frills like flying pigeons; it's simple to use with a built-in tutorial; and it doesn't use the multi-tasking abilities of the machine, or have resizeable windows. As they say, an "entry-level" WP package. I've seen a pre-release version of *TextcraftII*, and it's much improved, but still has a few glitches. Perhaps there will be a *TextcraftIII*.

The one I've used exclusively for some months is *Scribble!2* (ie it's the second edition) and it's a real word processor, with practically everything you'd need, and it uses the capabilities of the machine. So the windows are resizeable, up to four windows can be opened at once on screen, high resolution mode is possible with a full-screen page to allow you to see twice as much of your document and all the usual *Intuition* gadgets are used to good effect. There are Amiga-key commands available for most operations if you prefer not to use the mouse. And for partial converts from the IBM world, all the *Wordstar* keyboard commands are available - though I think that such people would inevitably move towards Amiga-style use in time.

Scribble!2 works best under *Workbench1.2*, which everyone should have been able to get by now (about $30 at your dealer for *WorkBench, Kickstart* and *Extras,* with a manual, and certainly worth getting) - you can enter information in requestors without clicking in them; all requestors accept the first letter of commands from the keyboard (so C for Cancel will work); and for storing, getting or replacing a file you don't have to wait until the requestor is fully loaded, you can interrupt at any time. There is a nice touch, where you can save a file as a .DOC extension, and select only those files to appear in the requestors, saving time and space.

The other benefit of using 1.2 software is that you can use Interlace from Preferences. In spite of what you may hear, it is possible to get a flicker-free screen in hi-res, simply by selecting the right combination of colours, and you get much more space available, whether you want to have one full-screen project running, or a combination of two or three simultaneous programs. I would recommend using this for your normal WorkBench/CLI screen for the same reasons.

Along with these functions come a few useful extras: there is a Dictionary provided with the program to which you can add words - this may be necessary, since it's not huge. The best way to use it is to load it into RAM, for the sake of speed, and check the spelling of your documents at will.

The screen display is not WYSIWYG, but there is a Preview command which allows you to see the document as it will appear printed, before printing. There are also numerous menu selections for formatting your document on screen and for printing. The other good extra is a Mail-Merge facility, allowing you to set up form letters with variable names, etc. Not everyone will need this, and it takes a little study of the explanation (on disk), but a powerful facility it is, extending the range of the program.

In short, I think *Scribble!2* is a powerful, easy-to-use Word Processor, and has set something of a standard for the Amiga, with the result that other programs, such as *PageSetter* (see below) have been devised to accept output specifically from it.

Another plus is that Brown-Wagh Publishing, who market it, also have available a spreadsheet called *Analyse!* and a database called *Organise!*, both of which use the same "look and feel" as *Scribble!2*, with easy transfer of data among the three.

Combining word processing with "idea" processing

If you're in the habit of writing reports, essays, presentations, or any documents requiring careful planning, you'll be interested in the concept of Idea Processors.

FLOW for the Amiga is such a one, and it's an excellent organiser of ideas, allowing you to create a constantly update-able outline or plan with minimum

fuss, and clear presentation.

It develops as your plan does - you decide on a main heading, which you can break down into sub-headings, each of which can be broken down, etc, so that you get a tree structure branching as you decide. Under any heading, you can enter further headings or just notes, which can be edited, removed, expanded, or printed out at any time.

This means that as you think of another point for some previous heading, you can simply click there and enter it, all the while maintaining a clear, clean structure. You can "collapse" the entire structure down to the main sub-headings, or selectively collapse particular parts only. One result of all this is that at all times you have a full record of what you've thought, all in the right place - no more or that "where did I put that piece of paper?" scenario (know it?).

Now you can use your outline with your Word Processor to create that masterpiece - for example, as you're putting your document together on *Scribble!2*, you can have your *Flow* outline sitting in a corner of the screen, collapsed or expanded as you like, and refer to it for the points required. In high res (and both programs support it) there's even more space.

Turning your documents into hard copy

Having finally written your document, you could just churn it out on your printer, and that is often sufficient. But it might be for a flash presentation, or for sizeable distribution, in which case you'll want to design some appropriate graphics and use a couple of fonts, as well as getting the clear sharp output of a laser printer.

Currently available in the way of Desktop Publishing software for the Amiga are *PageSetter* (in both regular and "international" versions), *ProWrite* and *Publisher*. Also available is *JetSet Plus*, a package which allows you to use multiple fonts in *Scribble!2* and *Textcraft*, and output the result on a Hewlett-Packard LaserJet Plus laser printer.

ProWrite is said to allow you to use multiple fonts and styles, import IFF graphics and combine these with your text, use different colours for your text which can be printed on a colour printer.

Publisher is claimed to be a powerful Desktop Publishing program, but calls to the local distributor have gone unanswered, so there is little I can tell you about it at present.

Having used *PageSetter* for some time, I can recommend it for the purposes mentioned above. It is easy to use, can access as many fonts as you can fit on a disk, and has its own built-in word processor and graphic editor. This means you can write and create graphics from within the program; but it is also possible to import text files as ASCII, *Scribble!* or *Textcraft* files, as well as graphics made with any popular Amiga Paint or Draw Program (ie in IFF format).

There are all the usual DTP bells and whistles, such as shadowing, boxes, styles and so forth. Kerning (the process of automatically reducing the white space between characters of type) is not supported yet, but you can set the maximum "tracking", or space allowable between characters and words.

PageSetter now supports the Postscript page-formatting language, which translates your formatted page into a form which can be output by any laser printer which understands the language. So it's now possible to get immediate camera-ready copy by simply printing out your pages on a Laserwriter or HP Laserjet printer. Or if you're a perfectionist, you can output to a laser typesetter like the Linotronic 100 or 300 which will provide resolution up to 2500 dots per inch! (well beyond the 300 or so available on your desktop printer).

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Fonts available

With the Amiga's potential for Desktop Publishing, software vendors are pouring out fonts of all kinds. There are about 40 fonts available in the public domain (on the Fish Disks) which are fine and can be imported into any fonts directory on any disk and be used, for example, in your Paint program, or the NotePad, or *Pagesetter*. There are numerous commercial offerings too - Zuma Fonts have three disks full of fonts; C Ltd have a number of font disks; JetSet have hundreds of fonts available for use with their Laser Printing software mentioned above; and Earthbound software have a low-priced disk full of Macintosh-type fonts; to name a few.

So there's no excuse for a boring page - in fact, care should be taken not to overdo things with a multiplicity of fonts, often a problem with non-professional page designers. And finally, if you're keen, the 1.2 Extras disk contains a Font Editor with which you can modify existing fonts, or create your own from scratch (not so easy).

About text editors

With all this high-powered processing talk, the humble text editor is often neglected. Within the "c" directory of any WorkBench disk you will find a very powerful full-screen text editor called ED, which is called up by entering ED Myfile.

Another Amiga-specific text editor is *TEXED*, with full mouse control and many features, a good commercial program. For those who only want to make notes and store text as ASCII characters (ie, without any embedded commands), these are quite sufficient and could certainly be used to write letters, etc.

References

SCRIBBLE! Version 2.0 - Brown-Wagh Publishing, available at your dealer. Approx $225.
PAGESETTER - Desktop Publishing for the Amiga, by Gold Disk Inc, available at your dealer. Approx $325.
PAGESETTER POSTSCRIPT & LASER DRIVER - Approx $69.
PRO-WRITE Requires memory beyond 512KB, works in interlace mode.Approx $245.
WRITE HAND - Approx $199.
PUBLISHER 1000 - Approx $385.
TALKER - Approx $99.
MEGADISC - Magazine on a disc for the Amiga, made in Australia, and currently the first two issues are available. Amongst other things, has further information on the subjects covered in this article. Write to: PO Box 759, Crows Nest, NSW 2065.

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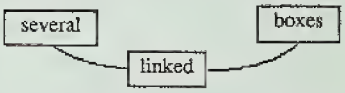

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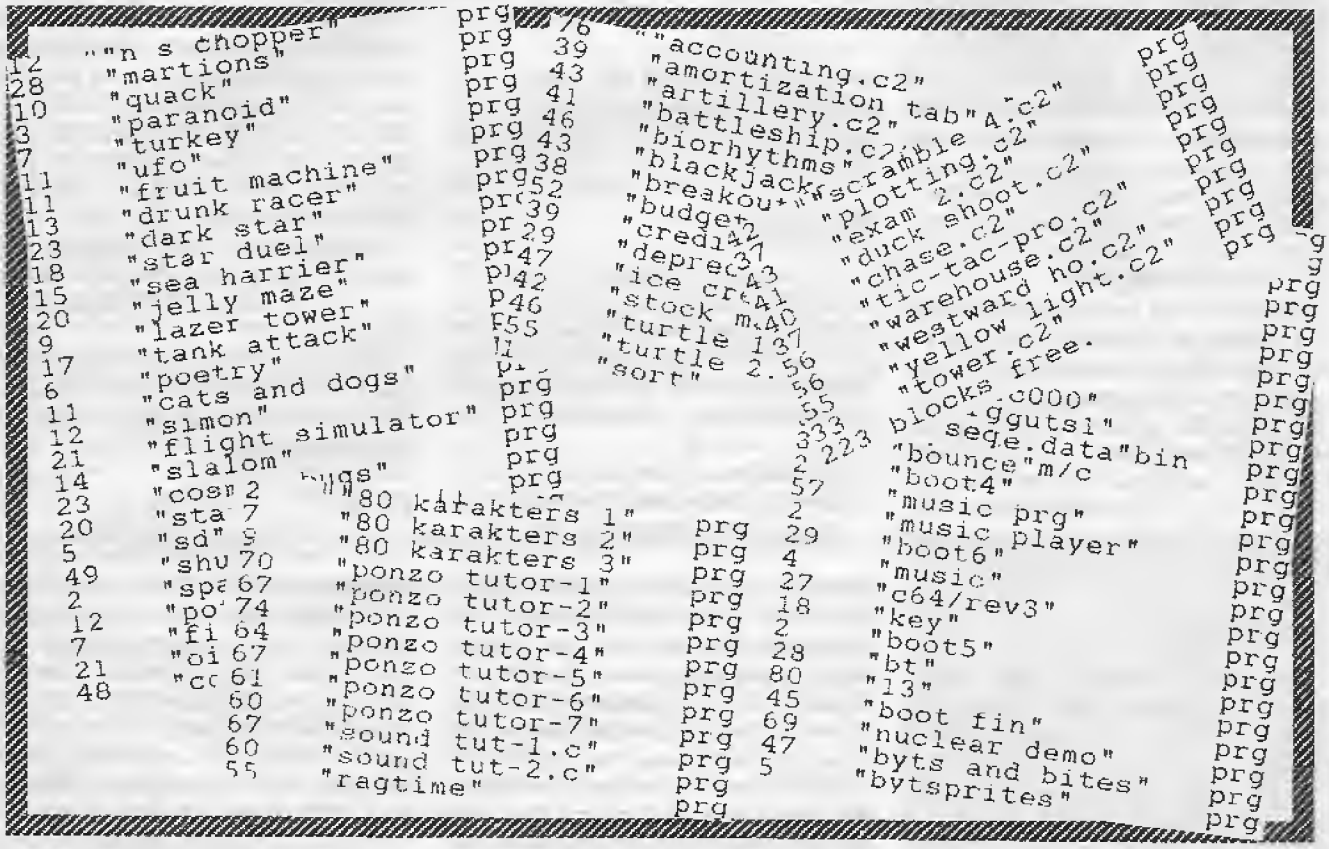

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Getting the Best Out of Disk Magazine Six

Due to popular demand, and for our own sanity, we have decided to further document the operation of our Disk Magazines - starting from Issue Six. The man behind the scenes, Andrew Farrell, endeavours to enlighten new and old users alike.

Our sixth issue marked the official launch of the Windows System. Disk Magazine Number Five was also updated to the new menu system, and a faster version was implemented. So the menu program on Disk Mag Six is in fact a slower version than the one which appears on Disk Mag Five.

The difference being that the Number Five version is compiled, which means the original Basic program with machine language sub-routines have been optimized into a semi-pre-interpreted version. This change makes the Window System operate much faster. Unfortunately, the improved version doesn't fit on the Number Six Disk, so it will have to wait for Number Seven.

Loading

It is at this stage that you discover whether Australia Post or our disk manufacturers have managed to produce and deliver a sound copy of your disk. To load the menu program, which will then give you access to the majority of programs and articles on the disk, type:-

LOAD"0:*",8 (Return)
RUN (Return)

The disk drive light will come on again momentarily, then the screen will turn white and a few seconds later the Windows logo will appear. If this doesn't happen, try to view a directory of your disk. If unsuccessful try this command:-

CLOSE 15:OPEN 15,8,15:PRINT#15,"I0:" (Return)

Now go back to the first step and try loading again. Failing that, return your disk to our Randwick address, and we will gladly send you out a replacement immediately.

Windows

A few moments later, the Windows logo will disappear and the proverbial desktop environment will be displayed. At first a Window will be open describing which copy of the Disk Magazine you have. In this case it should read:-

Prime Artifax Computer Software
Australian Commodore Disk Magazine
Premier Windows Edition - Issue Six

Press space, and you are ready to use the menu system. Try pressing the cursor left and right key and you will notice the words **Desktop, File** and **Special** will in turn become highlighted. When you are on the option you wish to select, press the return key.

A Window will now open providing a list of options available. You may move up and down these using the cursor key, and select one using the return key. To exit a Window, move to the top option and press cursor up or press cursor left or right to move immediately to the next desk option. Let's take a look at each of the options available from the Menu Bar.

Desktop

Three functions are available at present. All are an indication of what is to come rather than what you can actually do now. The three options work enough for you to see what they will do, but none are terribly useful just yet.

The **Clock** simply displays the number of hours, minutes and seconds that you've had your computer running since the most recent warm start. To exit the Clock just press any key.

Diary displays the days of the week into which you may enter appointments. Use the cursor keys to select a day then press return. Now a new Window will open with ten time slots. Once again use the cursor keys to select, and return to enter. You may then type in whatever information you like.

In this version your entries are not saved, however by Disk Magazine Seven we hope to have a fully operational version.

Notes work in a similar fashion to the Diary. Once again no saving of data as yet, but with more disk space this will be implemented soon.

File

The most functional of the three menu bar options is **File**. From here you can see what is really on the disk. Initially a Window will open providing six categories. Use the cursor keys to highlight your choice and the return key for select. An additional Window will then open listing the program names available. At this point press return on your choice to load and run a program.

Once you are in one of the disk programs it will be necessary to reload the menu program as you did originally. This may require that you reset or switch off and on your computer in some cases. We could have made it that you automatically returned to the Windows System, however this would mean that if you copied a program off the Disk Magazine to another disk it could cause some hassles.

Under the **Magazine** option you will find a list of articles which you may read. On Disk Mag Six there are only two due to space limitations.

In future we have definite plans to

Don't miss out on these great bargains!

Australian Commodore Review Disk Magazines Nos 1 to 6

Disk Magazine One

Features:

Forest Raiders - Full machine code shoot 'em up

Machine code paint, border, input and flash routines

Nice Lister - for readable listings on non-Commodore printers.

Recover II - for recovering deleted files, and a catalog program - for getting a disk directory without losing your program

And More...

Disk Magazine Two

Features:

Programs demonstrating 3D graphic plots

A terminal program called Teleport

A tutorial on bits and bytes

Character editor - for designing your own custom alphabets and graphics

A full demonstration of Electronic Card File

And More...

Disk Magazine Three

Programs:

Hangman
Calendar
Typing Practice
Bird Invaders
Labyrinth
Finance
Roadblock

Features:

Constructabrix - education and graphic construction program for younger users

And More...

Disk Magazine Four
Special Issue

Featuring:

Graphic Workshop _ a complete design system for sprites, graphics, and character sets - with tutorials

Also:

Typing Tutor - a completye typing program
Works on errors
Counts your speed

And More...

Disk Magazine Five

Our Biggest seller yet...

Featuring:

Utilities for using Newsroom on an MPS 802 plus printing disk cover with directories, writing signs, printing Doodle and Printshop pictures and more all on the MPS 802!

A demonstration of games in the future

And More...

Disk Magazine Six : Latest Release

Featuring:

Games:
Bert the Bug
Hangman

Demos:
Amiga Pharoah
Space Harrier
Max Headroom
The Pacer
Sade

Home Inventory

Graphics:
Light Fantastic

Utilities:
1571 Utility
DIR@828
Disk Filer

And More...

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resume our initial levels of editorial content - and hopefully more explanations of various programs on the disk.

Special

This is the final menu bar option that is really for future expansion more than anything. **Exit** simply returns to Basic from the Windows System, **Version** displays the version number of the Window System you are running, and **Clear** erases the Desktop area and redisplays the initial sign-on Window.

Games

So, now you know how to get at them, let's examine what they can do.

Under the **Games** category are two programs; *Hangman* and *Bert the Bug*. The first of these is a revamped version of one of the original Commodore Public Domain programs and the second was written by Jason Briggs, our budding graphics and machine code expert.

Once *Bert the Bug* is loaded there will be a brief delay whilst the program POKE's the redefined characters into memory. Instructions on game play are included. Before reloading the Window System type SYS 64738. This will correctly reset the 64's memory.

Demonstrations

Five in all, and the first of these, called **Amiga Pharaoh**, was produced by digitising a screen directly from the Amiga. The result is quite stunning, and an impressive example of what is possible using digitisation. An inexpensive digitiser for the Commodore 64 will soon be available - so stay tuned.

Some seventeen famous tunes are included such as the Dr. Who theme, and Queen's *Another One Bites the Dust*, and *We Will Rock You* - press A to Q to select. Soon to come is the software used to produce these tunes! Press Run-Stop Restore to quit, then reload Windows as originally.

Next up is **Space Harrier** which demonstrates a smart graphics and the theme from the game which has just been released. You'll need to switch off and on to get out of this one.

Max Headroom is an excellent example of animation using full high res screens. The most interesting aspect is the fact that the file is only 25 blocks long - obviously the result of some heavy duty compaction and very tight programming. We hope to be including the compactor used in a future issue.

The Pacer simply shows off the 64's power when it comes to animation and smooth scrolling. Where this routine ends up remains to be seen, but I'm sure it will make a hot game. Switch off and on to reload Windows.

Newlook International have really extended themselves this time with what I would consider one of the best musical arrangements on the Commodore 64. Younger eyes are best kept off the later half of the scrolling messages placed in the program by the designers - we are unable to accept any responsibility for the content of these notices and hello's.

Graphics

Light Fantastic is an active demonstration which you may control parts of. Instructions are included in the opening screen. Resulting patterns are not unlike those seen in the game *Styx*. Some enjoyable musical accompaniment is included. Reload Windows as per initial load.

Utilities

Six utilities in all are accessible, the first of these is **DIR828.**

Simply, this is a machine language program to obtain a disk directory without destroying your Basic program. Instructions are included. The program loads into memory normally used by the cassette buffer. Typing SYS828 executes the directory load.

Special Note: Some earlier versions of Disk Magazine Six did not correct the screen colours prior to loading of the DIR828 instructions. As a result it may be necessary to press RUN/STOP and RESTORE and then to re-run the instruction program once it has loaded.

Disk Filer is perhaps the most practical utility available for disk users. You will need to copy this program to another disk to use it best, however it will work as stands.

The program allows you to keep track of each and every piece of software that you have, its exact whereabouts by disk name and ID.

This particular version is window driven and is complemented by 'report1' which produces a five column directory of your programs.

Disk Labels and **Dual Labeller** both produce printed labels containing the disk directory. Both these programs have been compiled for additional speed.

The final utility accessible is for the 1571 as documented in one of our recent Commodore Reviews.

Home

In this category you will find a simple but effective **Home Inventory** program. The program allows a simple catalogue of all your household items to be entered and printed. The entire program is relatively simple to use and for those interested in programming contains descriptions of each of the main routines.

Well, that's it in a nutshell. Any additional files on the disk that you may see when viewing a directory are either part of a program you've already looked at or not directly operable. Notice that the disk is virtually completely full so it is advisable to copy any programs that write to the disk to somewhere with a little more space.

Until next issue, we hope that this guide has enabled you to further use our Number Six edition of the disk mag.

Hints & Tips

Auf Wiedersehen, Monty

1. **Generally** avoid anything that moves.

2. **Collect** all harmless objects.

3. **Spanish Football** must go to **Juventus.**

4. **Use lift tools** to repair Austrian Ski Lift.

5. **Take Chateau Blanc** to German Beer Keller (Dortmund).

7. **Swedish steering wheel** - take to Monaco.

8. **Take Cork** to the Boy in Amsterdam.

9. **Take Tulips** to Juliet in Pizza.

10. **Take Mona Lisa** to the Mafie Fence.

11. **Plane Tickets** must be used to fly.

* Collect all cherries, rabbits, ice cream you can find for extra lives.

* Watch out for Dangerous floor/wall types, you may become stuck. (or ELECTROCUTED.)

MAIN HINT: Do not stand around or under crushers.

AIRPORT LINK-UPS

Flew Airport Spain to Paris.

Flew Paris to Antwerp, Belguim.

Flew Antwerp, Belguim to Luxemberg.

Flew from Bonn to W. Berlin, to W. Germany.

Flew from Copenhagen to Byorn, Sweden.

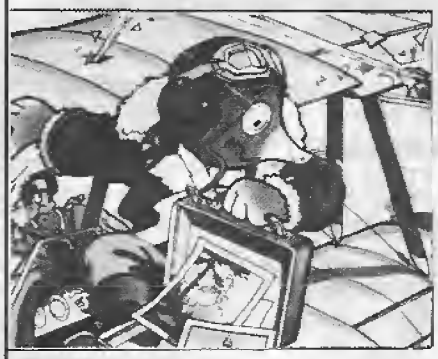
Flew from Amsterdam, Netherlands to Airport Spain.

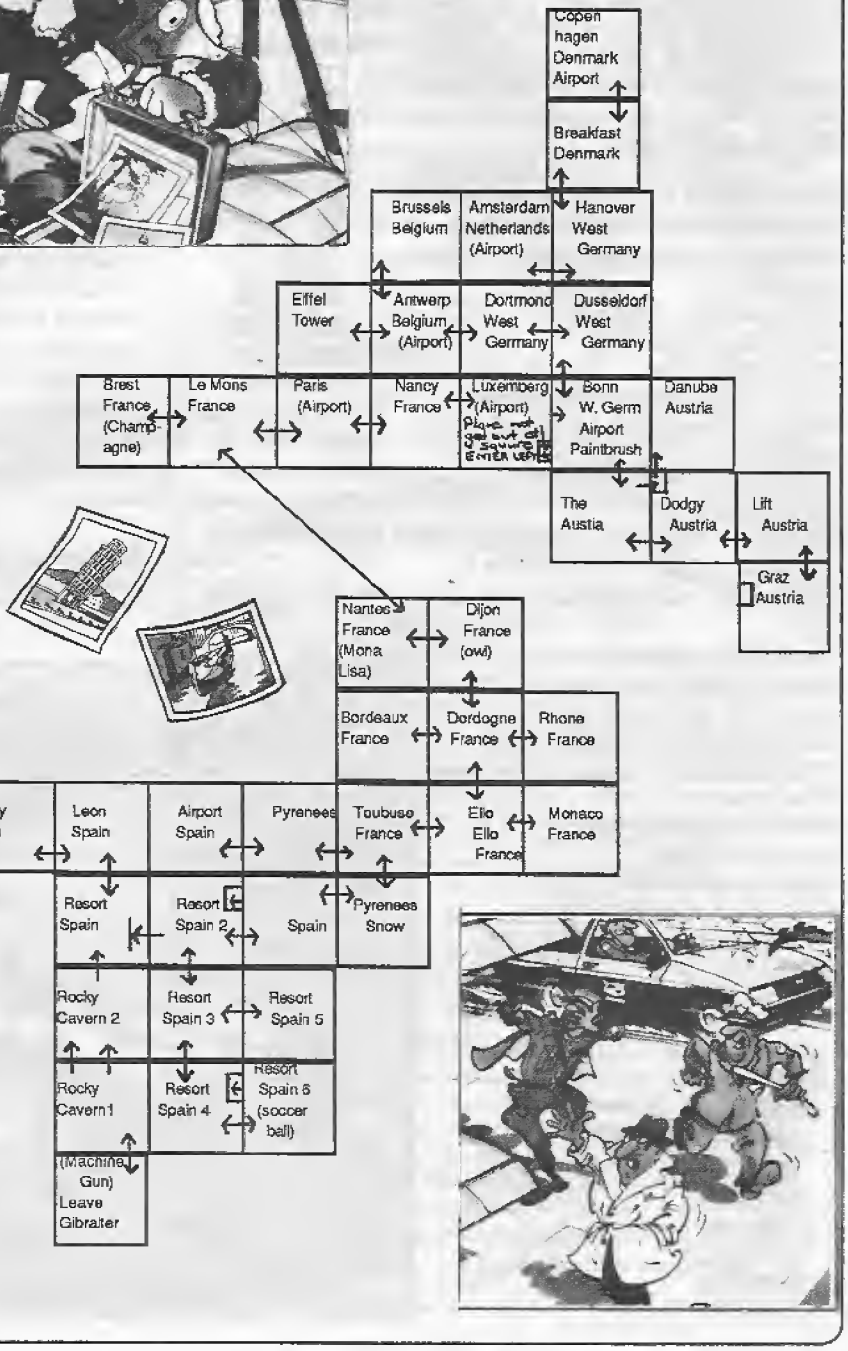
Flew from Luxemberg to Amsterdam.

Flew from Byorn, Sweden to Copenhagen.

Flew from W. Berlin, W. Germany to East Berlin, East Germany.

MAP - AUF WIEDERSEHEN, MONTY





HINTS & TIPS

GAME HINTS

WONDERBOY

I've just spent an afternoon trying to hack into *The Equalizer* - a budget game from Alpha Orange (The Power House) - a *Wonderboy* (very good arcade game) clone and a good game to boot. Anyway - load; reset and
POKE25661,169:POKE25662,0:POKE25663,234:SYS16606
starts the game, and upon playing, all ground-based meanies don't attack - they just fall off the screen....not very good, I know (I tried so hard for infinite lives POKE) but it works well.

SPACE HARRIERS

I'm sure you've seen a few *Space Harrier* POKE's floating around; I made a few of my own. Never the less, here are all the ones I've recently collated: LOAD, reset then:
POKE 5834,96 - infinite times
6010,173 - infinite lives
2214,1-255- , time
6543,0 - invincibility to alien missiles
6059,0 -invincibility to indestructible objects
POKE7236,0: POKE7231,0 - auto fire during game
6666,234 - destroys all destructible objects on screen
12707,1-15 - colour of trees on the first level
14631,127 - slows it down
2456,69 - speeds it up a bit
14212,234 - the fastest 3D you've ever seen! REALLY worth trying.
POKE2375,234 - trees fly around, timer stops
POKE2213,255:POKE8110,0 - removes all poles
53277,3 - Fat Harrier
53271,3 - Bow-legged Harrier
And for a Full Screen Harrier:
POKE14437,32
14438,1
14439,8
14578,32
14579,1
14580,8
2049,141
2050,33
2051,208
2052,141
2053,32
2054,208
2055,169
2056,10
2057,141
2058,186
2059,78
2050,96
SYS 2128 restarts

The above redirects the raster that draws the horizon to draw the horizon in the border, as well. Also stops loss of lives!! CAUTION: Doing them all at once (the above pokes, that is) will probably crash the '64.

GAUNTLET!!! You scream YES!!!
I reply, "reset, then"
POKE 41021,189
44373,189
44381,189
47658,189
47666,189
48514,189
48524,189
50357,189
50367,189
50814,189
50824,189
All the above give you unlimited health.
POKE 48621,96 - monsters ignore you
POKE 49009,96 - and they won't kill you
SYS32768 to start on level one.

SCOOBY DOO

Yawn..... isn't Scooby Doo rubbish? Never mind - invincibility becomes you if you LOAD, RESET then:
POKE 7950,96:SYS2560
Not worth it, was it? Wasted effort on my behalf.

DRUID

Myself, I believe *Druid* is superior to *Gauntlet* so:
LOAD, RESET then:
POKE35731,12:POKE35744,0 (RET)
POKE37940,0:POKE39421,0 (RET)
POKE35779,76
POKE35780,215
POKE35781,139
SYS 5120 starts.

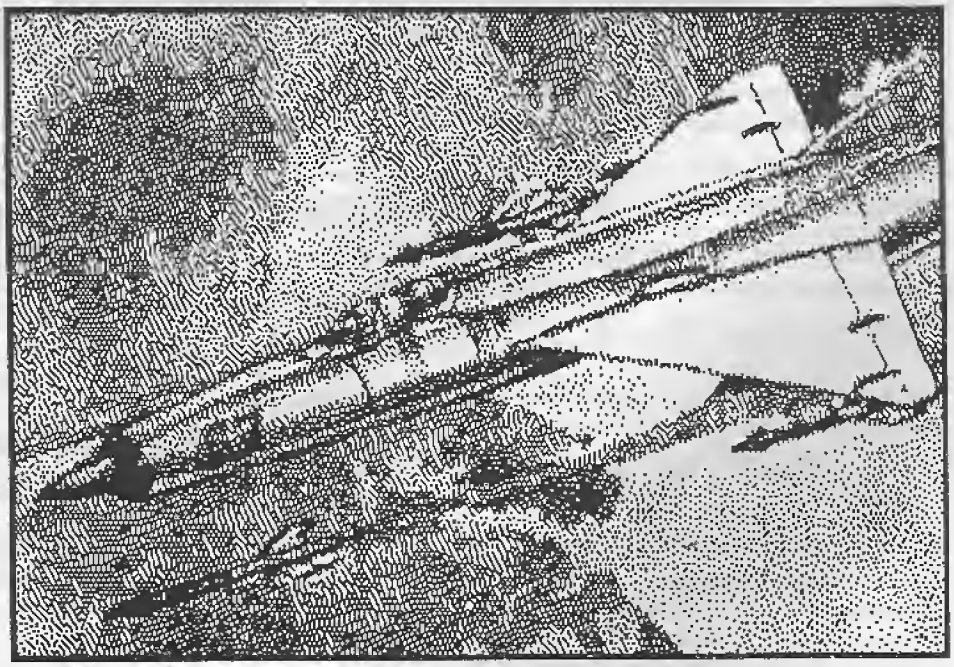
Oh, and to kill the skulls, go next to them and actually touch them (I've given you infinite energy so it doesn't matter) and use a CHAOS spell to kill it.

To complete the game, you must kill all the skulls. To gain the maximum rating (Lightmaster, I think) you must open every chest, kill each type of monster with each type of weapon (water, fire, electricity) and kill all skulls.

Well I did plan to send in some maps, but now *Zzap!* have printed an equivalent map to each one I've done,people will assume me to be a plagarist and therefore I'll forget the maps.

Never mind.

Mark Walterfang
Sunnybank Hills, Qld..



AUTO RUNNING DISK PROGRAMS ON THE C64

BY GLEN DRUCE

Have you ever wondered how all those commercial programs for which you continually fork out, run automatically? The answer is fairly simple and after a little direction from this article you to will be able to have your own 'auto running' programs.

The greatest benefit from this program is to have it on program work disks. This way when examining earlier programs you don't have to firstly find a fast loader program, then load it, then try and remember the run address, then load the directory, then list the directory! It is all done in one simple step LOAD"↑",8,1 which loads and runs the fastloader, as well as listing the directory to the screen. Undoubtedly there are many people who would like this ability so the example used shows you how to do this.

To understand how the program works we must know how the C64 loads programs.When the load command is given the current address shown on program counter (which is a two byte number) is pushed onto the stack. When the load has been completed the 'machine' then takes this address off the stack and continues running from that address +1, however, more about that later.

The 'auto running' program loads at address $0100 ($ denotes hexadecemal). This is caused by the first two numbers of the program file being $00 and $01 in low-byte hibyte format. This is where the trick comes in, it just so happens that the stack which we mentioned earlier is from the address $0100 to $01FF so our program overwrites the stack.

Overwrites the stack with what you may ask. With the number 2 (believe it or not). The reason 2 is used is that the auto run program starts at $0203 (once again in hexadecimal), so when the program has been loaded the 'machine' takes the two bytes off the stack, as these represent the last address before the load was encountered, add one to it and continue running from that address. This way in the example $02 is taken from the stack (which now contains nothing but $02's) giving an address of $0202 to which it then adds one, giving $0203 the start address of our program.

Unfortunately there are several restrictions, this program must be less than 86 bytes long and must be in machine code. Also the stack is full of $02 so if you try to return to BASIC with an RTS command all sorts of strange things may occur. To combat this, the basic warm start subroutine at $E37B is highly recommended. If this last part was foreign to you, "Don't Panic," as the example program handles all these problems.

Listing 1 is an example listing which sets up an auto-running program like that in listing 2. Listing 1 will create a program called "↑", this can be changed to whatever you wish in line 10 of the first listing. An arrow is used as it is a fairly recognisable name. So type in the program as it appears (preferably in uppercase). There are checksums on the data statements (rem statements may be ommitted).

Once you have entered Listing 1 it is in your best interests to SAVE IT!!!, much hair has been torn out after a failure to do so! For identification purposes a file name such as "make-autorun" is advisable.

You may now run the program, after a few seconds the disk status should appear as 'ok,' if it does then read on, if not then check for typo errors. As is, your auto run program will load a program called turbo and initialise it.

Now is the time for a little thought. The example program, the one you have just entered (Listing 1), has been written to load and initialise a program or fastloader called "turbo", if your understanding of machine code is limited then simply transfer any software based fastload program from wherever onto the disk with the arrow program on it and rename it as such.

```
OPEN15,8,15
PRINT#15,"R:TURBO=oldname"
CLOSE15
```

The next and probably the second largest problem you will encounter (the largest is typing the program in) is that of the start address of your turbo program. In the example program (Listing 1) this is presumed to be $C800. However, this is not always so, and a wrong start address could cause one of those moments when you tear your hair out if you fail to save the program (more commonly known as a

Listing 1

```
1 rem**********************************
2 rem**          AUTO RUN              **
3 rem**     BY GLENN DRUCE             **
4 rem**        ©CML XXXV!!             **
5 rem**********************************
10 open5,8,5,"@:↑,p,w":rem ↑ is file name
20 print#5,chr$(0);:print#5,chr$(1);:rem load add. $0101
30 for i=0to258:print#5,chr$(2);:next i:rem fill stack $02
40 for i=1to8
50 forda=1to8
60 readd
70 print#5,chr$(d);
80 lt=lt+d
90 nextda
100 readda:ifda<>ltthenprint"check data in line "49152+(i-1)*8:stop
110 lt=0
120 next i
130 close 5
2000 open15,8,15:input#15,a$,b$:print a$,b$:close15
49152 data 169,4,160,255,162,8,32,186,976
49160 data 255,169,5,162,54,160,2,32,839
49168 data 189,255,169,0,160,255,162, 255,1445
49176 data 32,213,255,169,1,162,59,160,1051
49184 data 2,32,189,255,169,0,160,255,1062
49192 data 162,255,32,213,255,32,0,200,1149
49200 data 76,0,192,84,65,82,66,79,664
49208 data 77,1,0,0,0,0,0,0,78
```

```
Listing 2

1000  .page'auto run
1010        *=$0203         ;start address
1020        prun=$c000      ;start address of prog. m
1030        turun=$c800     ;start address
1040        load=$ffd5      ;kernal load routine
1050        setlfs=$ffba    ;kernal setfile routine
1060        setnam=$ffbd    ;kernal setname routine
1070                        ;load turbo program
1080  turbo lda #$04        ;logical file no. 4
1090        ldy #$ff        ;no secondary address
1100        ldx #$08        ;device disk drive
1110        jsr setlfs      ;jsr setfile
1120        lda #name1-name ;name length
1130        ldx #<name      ;lo bit of name
1140        ldy #>name      ;hi bit of name
1150        jsr setnam      ;jsr setname
1160        lda #$00        ;load
1170        ldy #$ff        ;at address on file
1180        ldx #$ff        ;
1190        jsr load        ;jsr load
1200                        ;
1210                        ;load directory program
1220  opprg lda #name2-name1;name length
1230        ldx #<name1     ;lo bit of name
1240        ldy #>name1     ;hi bit of name
1250        jsr setnam      ;jsr setname
1260        lda #$00        ;load
1270        ldy #$ff        ;at addres shown in file
1280        ldx #$ff        ;
1290        jsr load        ;jsr load
1300        jsr turun       ;initialize turbo program
1310        jmp prun        ;run directory program
1320 name   .byt 'turbo'    ;name of turbo program
1330 name1  .byt 'm'        ;name of directory program
1340 name2  .byt ''
1350 .end
```

```
Listing 3

10 rem*********************************
20 rem**    LOAD ADDRESS              **
30 rem**    BY GLENN DRUCE            **
40 rem**    MCMLXXXVII                **
50 rem*********************************
60 open1,8,3,"0:turbo"
70 get#1,lb$
80 if lb$=""then lb=0:goto 80
90 lb=asc(lb$):ch=949
100 hb=asc(hb$)
110 print"line 49192 should read"
120 print"49192 data 162,255,32,213,255,32,"lb","hb","ch+lb+hb
130 close 1
140 end
```

```
Listing 4

10 open8,8,8,"@:m,p,w"
20 print#8,chr$(0);:print#8,chr$(192);
30 forx=1to5
40 fory=1to8
50 readda
60 lt=lt+da
70 print#8,chr$(da);
80 nexty
90 readcs
100 if lt<>cs thenprint"check data line "49152+(k-1)*8
110 lt=0
120 next
130 close8
49152 data 162,0,189,27,192,157,119,2,848
49160 data 224,11,240,4,232,76,2,192,981
49168 data 169,11,133,198,141,137,2,32,823
49176 data 123,227,96,76,111,34,36,34,737
49184 data 44,56,13,76,105,13,0,0,307
```

```
Listing 5

1000 .page  lister
1010        keyd  =$0277 ;keyboard buffer
1020        ndx   =$00c6 ;length of queue
1030        xmax  =$0289 ;size of keyd
1040        wamsta=$e37b ;warm start routine
1050 *=$c000             ;start address
1060 loadm  ldx #00      ;
1070 jmpl   lda print,x  ;load characters
1080        sta keyd,x   ;into keyboard
1090        cpx #11      ;buffer
1100        beq standx   ;all loaded ?
1110        inx
1120        jmp jmpl     ;no do it again
1130 standx lda #11      ;yes store number
1140        sta ndx      ;in lenght of keyd
1150        sta xmax     ;and also in size
1160        jsr wamsta   ;jump to warmst
1170        rts          ;begin operations
1180 print  .byte 76,111,34,36,34,44,56,13,76,105,13
1190                     ;message which is put in
1200 .end                ;buffer
```

crash).

If you do not already know the start address of your particular turbo program, the way which generally (but not always) works is to find the load address. This can be done with the aid of listing 3. Once again remember to save before using.

So once you have found how line 49192 of the first listing should read WRITE IT DOWN and reload your Listing 1 (probably saved as make-autorun), retype the line and save with replace (save"@:make-autorun). If you already knew the start address of your turbo program then just put it in lobyte, hibyte form in line 49192 at positions 7 and 8 respectively and recalculate the checksum for that line (position 9).

Finally there are listings 4 and 5. Listing 4 is a basic loader of the machine language (source listing) in Listing 5. Type it in as is, then SAVE IT. After saving it, run it (run(ret))and it will create a file called M. This is the file which executes (or runs) a warm start routine and loads as well as lists the directory.

A quick word about the last two listings - these use the keyboard buffer, that way whenever the processor has a bit of spare time it reads from the buffer the characters which have been received from the keyboard and then prints them to the screen. It then, if necessary, acts upon these commands if it can recognise them. In listings 4 and 5 the buffer is loaded with the string LOAD "$" ,8 (ret) and LIST (ret) (note both of these are in their abbreviated forms in the program). So when the computer returns from the machine code it finds these commands in the buffer, it acts upon them, and 'voila' we have the basic commands for listing the directory.

With a little understanding and knowledge these programs can be used in many areas; for example, rather than having "M" being a program which lists the directory, you may like to have it as a utility program which you often use.

To the best of my knowledge (though I have not tried it) this process should work with a tape.

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System Name: ARROW KBBS
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Phone: (02) 95 5377
Hours: 24 Hours
Sysop: Daniel Moran
Access: Public

System Name: Ausborne Users Group RCPM
Phone: (02) 568 2791
Hours: 24 Hours
Sysop: M. McGlynn-Worthington

System Name: AUSOM
Phone: (03) 877 1990
Hours: 24 Hours
Sysop: Grahame Willis
Access: OPEN 7 CLUB MEMBERS

System Name: Auzline
Phone: 636 9027
Hours: 24hrs
Sysop: Rasterman
Access: Mem/Vis

System Name: Auzline BBS
Phone: (02)688-1006
Hours: 10-5 WD 10-8 WE
Sysop: Chris Pattison
Access: Free
Machines: Commodore

System Name: Balmain RCPM
Phone: (02) 660 8182
Hours: 24 Hours
Access: Reg/VA

System Name: Basic Users Group of Melb (BUGM) RCPM
Phone: (03) 500 0562

System Name: Bert
Phone: (02) 211 0855
Hours: 24 Hours

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Phone: (07) 395 1809
Sysop: Rik Dalley

System Name: Breside Omen
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Hours: 24 Hours
Sysop: Geoff Arthur
Access: Public

System Name: Brisbane Commodore User Group BBS
Phone: (07) 808 2125

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System Name: Brisbane Microbee User Group RCPM
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System Name: C S A C E (Atari)
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Sysop: Larry O'Keefe
Access: Reg/VA

System Name: C-64 BBS
Phone: (03) 489 4557
Hours: 24 Hours
Access: $20 PER 6 MONTHS
Machines: CP/M SYSTEM

System Name: C-64 BBS (Vic)
Phone: (03)489 4557
Hours: 24 Hours
Sysop: Alan Miles
Access: Mem
Machines: Commodore

System Name: C.C.U.G.Q BBS
Phone: (07)808-2125
Hours: 24 Hours
Sysop: Ray King
Access: Mem
Machines: Commodore

System Name: Cairns & District IBBS
Phone: (070) 51 3582
Hours: WD 1800-0800 24H WE

System Name: Canberra IBBS
Phone: (062) 58 1406
Hours: 24 Hours EST

System Name: Canberra RBBS
Phone: (062) 88 8318
Hours: 24 Hours EST

System Name: Canberra User Group
Phone: (062) 54-7365
Hours: 24 Hours
Sysop: James Hacker
Access: Free
Machines: Commodore

System Name: CLUB AMIGA BBS
Phone: (02) 521 6338
Hours: 24 Hours
Sysop: Ross Kellaway
Access: VIS/MEM
Machines: COMMODORE AMIGA & C64

System Name: Club-80 (SYDTRUG) RTRS
Phone: (02) 332 2494
Hours: 24 Hours
Sysop: Michael Cooper
Access: Mem/VA

System Name: Colour Computer Link
Phone: (075) 32 6340
Hours: 24 Hours EST

System Name: Comet 64
Phone: (02) 599 7342
Hours: 24hrs
Sysop: Eric
Access: Ultra-Term/Rterm
Machines: Commodore

System Name: Comm Link BBS
Phone: (02)875-4817
Hours: 24 Hours
Sysop: Micheal Hayter

COMMUNICATIONS

Access: Mem
Machines: Commodore

System Name: Comm-Link
Phone: (043) 413 135
Hours: 24 Hrs
Sysop: Jeff Campbell

System Name: COMMBOARD 068
Phone: (068) 47-1197
Hours: 24 Hours
Sysop: Gary Edwards, Colin Swan
Access: Members
Machines: Commodore

System Name: Commodore 64 KBBS
Phone: (02) 664 2334
Hours: 24 Hours
Sysop: Graham Lee
Access: Reg/VA
Machines: Commodore

System Name: Competron IBBS
Phone: (07) 52 9498
Hours: WD 1700-0600/WE24HES

System Name: Computer Ventures BBS
Phone: (08) 255 9146
Hours: 24 Hours CST

System Name: Computer-Cations
Phone: (03) 482-1271
Hours: 24 Hours
Sysop: Joshua Duffy
Access: Free
Machines: Commodore

System Name: Computers Galore BBS
Phone: (03) 561 8479
Hours: 24 Hours EST

System Name: Connect 64 BBS
Phone: (07)393-5352
Hours: 24 Hours
Sysop: Craig Upton
Access: Free
Machines: Commodore

System Name: Contact RCPM
Phone: (02) 550 0984
Hours: 24 Hours
Sysop: Steven Williams, Ron Lynch
Access: Mem/LVA
Machines: All (Amiga Section)

System Name: CUSTOM PROGRAMMING SERV.
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Hours: 24 Hours
Sysop: Alan Williamson
Access: $12 p.a.
Machines: IBBS

System Name: CYCOM
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Sysop: Darren Haysom
Access: SEMI-OPEN
Machines: FIDO

System Name: Datacomm KBBS
Phone: (02)643-1220
Hours: 24 Hours
Sysop: James Butler
Access: Mem
Machines: Commodore

System Name: DECUS
Phone: (03) 63 9133
Hours: 24 Hours
Sysop: Jay Ondracek
Access: LIMITED PUBLIC
Machines: FIDO

System Name: Dick Smith RIBM
Phone: (02) 887 2276
Hours: 24 Hours
Sysop: Steven Engel
Access: Public

System Name: DOWN UNDER SOFTWARE
Phone: (03) 429 5819
Hours: 24 Hours
Sysop: Greg Hudson
Access: OPEN
Machines: FIDO

System Name: Dreamtime FRP BBS
Phone: (02)93-5225
Hours: 9.30pm - 7.30am
Sysop: Chris Geddes
Access: Free
Machines: Commodore

System Name: East Ringwood RCPM
Phone: (03) 870 4623
Hours: 1600-000EST Weekdays

System Name: EASTCOM FIDO
Phone: (03) 288 0775
Hours: 24 Hours
Sysop: Maurie Halkier
Access: SEMI-OPEN
Machines: FIDO

System Name: EASTWOOD RCPM
Phone: (03) 870 4623
Hours: 24 Hours
Sysop: Mick Stock
Access: REG. $10
Machines: CP/M - OS9

System Name: Edge of Darkness
Phone: (02)522-7919
Hours: 7.30pm - 3.00pm
Sysop: Andrew Levell
Access: Free
Machines: Commodore

System Name: ELECTRONIC CROSSOVER
Phone: (03) 367 5816
Hours: `24 Hours
Sysop: Stephen Paddon
Access: SEMI-OPEN
Machines: FIDO

System Name: Electronic Oracle IBBS
Phone: (08) 260 6686
Hours: 24 Hours CST

System Name: FORTRESS
Phone: (03) 589 1692
Hours: 24 Hours
Sysop: The King
Access:OPEN Adventure atmosphere
Machines: Custom Software

System Name: Frontier Systems RIBM
Phone: (02) 875 2606
Hours: 24 Hours EST
Sysop: John Stanton
Access: Public

System Name: Futex - C64 BBS
Phone: (07) 283-2034
Hours: 24 Hours
Sysop: Paul Salanitri
Access: Free
Machines: Commodore

System Name: Galaxy (Apple) BBS
Phone: (02) 875 3943
Hours: 24 Hours
Sysop: Chris Nelligan
Access: Public

System Name: Gippsland RCPM
Phone: (051) 799 2001
Hours: 24 Hours EST

System Name: Goblin Sound RMAC
Phone: (02) 660 8182
Hours: 24 Hours
Sysop: Ned Whitford
Access: Reg/LA

System Name: HARBOARD - 64
Phone: (03) 587 2504
Sysop: Dave J. Harbour
Access: $10 REG.
Machines: C64

System Name: Hi-Tech CBBS
Phone: (07) 38 6872
Hours: 24 Hours EST

System Name: Hisoft BBS
Phone: (03) 799 2001
Hours: 24 Hours EST

System Name: Hotline BBS
Phone: (07) 353 3718
Hours: 24 Hours
Sysop: Lionel Theunissian
Access: Free

System Name: Illawarra BBS
Phone: (042) 84 4354
Hours: 24 Hours
Sysop: John Simon
Access: Mem/Vis
Machines: All

System Name: Infor-Centre BBS
Phone: (02) 344 9511
Hours: 24 Hours
Sysop: Paris Radio
Access: Mem/VA

System Name: INNER SANCTUM
Phone: (03) 233 8346
Hours: 24 Hours
Sysop: Robert Swaab
Access: SEMI-OPEN
Machines: OPUS ONLINE GAMES

System Name: Irata BBS
Phone: (02) 600 9041
Hours: M/F1800-0000 24H W/E
Sysop: Paul Sommers

System Name: Keeboard TBBS
Phone: (02) 629 2230
Hours: 24 Hours
Sysop: Phillip Keegan
Access: Public

System Name: MACBOARD BBS
Phone: (03) 435 9152
Hours: 24 Hours
Sysop: AUSOM Inc.
Access: OPEN
Machines: MACINTOSH

System Name: MAGIC PUDDING
Phone: (03) 428 2178
Hours: 24 Hours
Sysop: Rupert Russell
Access: OPEN
Machines: OPUS

System Name: Mail-Bus
Phone: (051) 27 7245
Hours: 24 Hours EST

System Name: Manly BBS
Phone: (02)977-6820

COMMUNICATIONS

Hours: 24 Hours
Sysop: Chris Patten
Access: Free
Machines: Commodore

System Name: Melbourne Micro Computer Club CBBS
Phone: (03) 762 5088
Hours: 24 Hours EST

System Name: Melbourne Microbee User Group RCPM
Phone: (03) 873 5734
Hours: 24 Hours EST

System Name: Mi Computer Club RCPM
Phone: (02) 662 1686
Hours: 24 Hours
Sysop: Your Computer Mag
Access: Mem/VA

System Name: MICOM CBBS
Phone: (03) 762 5088
Hours: 24 Hours
Sysop: Peter Jetson
Access: LIMITED VISITORS

System Name: Micro Design Lab RCPM
Phone: (02) 663 0151
Hours: 24 Hours
Sysop: Steven Jolly
Access: Public

System Name: MICROBEE RCPM
Phone: (03) 82 1571
Hours: 24 Hours
Sysop: Mike Thompson
Access: LIMITED VISITORS
Machines: MICROBEE

System Name: MICROLINK
Phone: (03) 233 0230
Hours: 24 Hours
Sysop: Micro-Drunks
Access: OPEN
Machines: TRS-80

System Name: Micropro Computers RCPM
Hours: 24 Hours EST
Sysop: (03) 568 8180

System Name: MIDNIGHT FROG
Phone: (03) 569 1589
Hours: 24 Hours
Sysop: Scott Enwright
Access: SEMI-OPEN
Machines: FIDO

System Name: MIKES BULLBOARD
Phone: (03) 459 6439
Hours: 1800-0900 weekdays
Sysop: Mike Lewis
Access: SEMI-OPEN

System Name: MIN-NET BBS
Phone: (054)41-3013
Hours: 24 Hours
Sysop: Mal Fields
Access: Mem/Vis

System Name: MOTEL INTERNATIONAL
Phone: (03) 509 9611
Hours: 24 Hours
Sysop: Kim Graton
Access: SEMI-OPEN
Machines: PBBS

System Name: MS-RBBS TRRS
Phone: (003) 34 0911
Hours: 24 Hours
Sysop: Mike Scott

System Name: Multiple BBS (Multi-BBS)
Phone: (08)255 5116
Hours: 24 Hours

System Name: NATIONAL
Phone: (03) 25 6904
Hours: 0600-1900/1930-0400
Sysop: John Blackett-Smith
Access: SEMI-OPEN FIDO NETWORK Machines: OPUS

System Name: Newcastle Microcomputer Club RCPM
Phone: (049) 68 5385
Hours: 1700-830wk24HrESTwe

System Name: Nexus Education Dept BBS
Phone: (08)243 2477
Hours: 24 Hours

System Name: Oasis BBS
Phone: (09)383 1480
Hours: 24 Hours
Sysop: Computer Oasis
Access: Vis/Mem
Machines: All

System Name: Omega Line/ Breskie Omen
Phone: (02) 457 8281
Hours: 24 Hours
Sysop: Geoff Arthur
Access: Public

System Name: Omen II RTRS
Phone: (089)27 4454
Hours: 24Hours

System Name: Omen II RTRS
Phone: (09)279 8555
Hours: 24Hours

System Name: Omen IV RTRS
Phone: (03) 846 4034
Hours: 24 Hours EST

System Name: Omen RTRS
Phone: (02) 498 2495
Hours: M-F 1630-900F-M24Hrs
Sysop: Ted Romer
Access: REG/VA

System Name: Omen V RTRS
Phone: (08)243 2477
Hours: 1800-0700 Daily

System Name: Oracle TBBS
Phone: (02) 960 3641
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System Name: OUTER LIMITS
Phone: (03) 725 6650
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Sysop: Captain Kirk
Access: OPEN Science Fiction
Machines: FIDO

System Name: PACIFIC ISLAND
Phone: (03) 890 2174
Hours: 24 Hours
Sysop: Craig Bowen
Access: OPEN
Machines: GBBS/APPLE

System Name: Palantir C-64 BBS
Phone: (02) 451 6576
Hours: 24 Hours
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Access: Free

System Name: PC Connection BBS
Phone: (03) 528 3750
Hours: 2100-1800WD/24HEstWE

System Name: PC DOMAIN
Phone: (03) 789 8918
Hours: 24 Hours
Sysop: Daryl Clayton
Access: SEMI-OPEN
Machines: FIDO

System Name: PC-CONNECTION
Phone: (03) 528 3750
Hours: 24 Hours
Sysop: LLoyd Borrett
Access: REG
Machines: IBBS

System Name: Perth RMPM
Phone: (09)367 6068
Hours: 24 Hours

System Name: Phantom Land KBBS
Phone: (02)399-7716
Hours: 24 Hours
Sysop: Bob James
Access: Free
Machines: Commodore

System Name: POVERTY
Phone: (03) 309 0192
Hours: 24 Hours
Access: SEMI-OPEN
Machines: BBS - AMIGA

System Name: PROFIT
Phone: (03) 529 8749
Hours: 24 Hours
Sysop: Andrew Hooper
Access: OPEN
Machines: FIDO

System Name: Prophet TBBS
Phone: (02) 628 1930
Hours: 24 Hours
Sysop: Larry Lewis
Access: Public

System Name: Pursuit KBBS
Phone: (02) 522-9507
Hours: 24 Hours
Sysop: Warren Hillsdon
Access: Mem
Machines: Commodore

System Name: RCOM BBS
Phone: (02) 667 1930
Hours: 24 Hours
Sysop: Simon Finch Ian Allen
Access: Members
Machines: Commodore

System Name: Red CentreRCPM
Phone: (075)32 6340
Hours: 24 Hours

System Name: RUNX Unix System
Phone: (02) 48 3831/4871860
Hours: 24 Hours
Sysop: Mark Webster
Access: Mem/LVA

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Phone: (03) 754 5081
Hours: 24 Hours
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Access: MEMB. TO SCUA
Machines: ROS

System Name: SA Commodore BBS
Phone: (08)371 0435
Machines: Commodore

COMMUNICATIONS

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Phone: (03) 563 1117
Hours: 24 Hours
Access: SEMI-OPEN
Machines: OPUS

System Name: Sentry BBS (VIC 20)
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Sysop: Trev Roydhouse
Access: Public

System Name: Skull Apple ABBS
Phone: (02) 529 89750
Hours: 24 Hours
Sysop: Les Ayling
Access: Reg/VA

System Name: SMUG BBS
Phone: (02) 607 7584
Hours: 24 Hours
Sysop: Bob Fryer
Access: Reg/VA

System Name: Software Tools RCPM
Phone: (07) 378 9530
Hours: 24 Hours EST

System Name: Sorcerer Computer Users ASSOC. CBBS
Phone: (03) 434 3529
Hours: 24 Hours EST

System Name: Sorcerer RCPM
Phone: (02) 387 4439
Hours: wd 1800-0800 EST
Sysop: John Woolner
Access: Mem/VA

System Name: SOUTHERN CROSS
Phone: (03) 690 7220
Hours: 24 Hours
Sysop: D. Harvey et al
Access: OPEN
Machines: GBBS

System Name: Sydney PC User Group RIBM
Phone: (02) 238 9034
Hours: 24 Hours
Sysop: Geoff May
Access: Reg/VA

System Name: Tandy ACCESS RIBM
Phone: (02) 625 8071
Hours: 24 Hours
Access: Reg/VA

System Name: TARDIS RCPM
Phone: (03) 67 7760
Hours:1800-0800M-F 24hr W/E
Sysop: Malcome Miles
Access: OPEN
Machines: RCPM

System Name: Tardis RCPM
Phone: (03) 67 7760
Hours: 1800-0900Wd/24hWe/Es

System Name: TELEGRAPH ROAD
Phone: (03) 743 6173
Hours: 24 Hours
Sysop: KIT
Access: SEMI-OPEN
Machines: PBBS/APPLE
System Name: Tesseract RCPM
Phone: (02) 651 1404
Hours: 24 Hours
Sysop: John Hastwell-Batten
Access: Reg/VA

System Name: Texas Instruments (TISHUG)
Phone: (02) 560 0926
Hours: `M-F 1900-0700 we24h
Sysop: Shane Anderson
Access: Reg/VA

System Name: The Eagle's Nest BBS
Phone: (02) 451-0535
Hours: 24 Hours
Sysop: Phillip Dean
Access: Mem
Machines: Commodore

System Name: THE REAL CONNECTION
Phone: (03) 288 0331
Hours: 24 Hours
Sysop: Carla Miller
Access: SEMI-OPEN
Machines: FIDO

System Name: TI BUG BBS
Phone: (07) 263 6161
Hours: 9pm-6am Weekdays

System Name: Tomorrow Land's DIRECT
Phone: (02) 411 2053
Hours: 24 Hours
Sysop: John Thwaite
Access: Reg/VA

System Name: TOMORROWLAND -RBBS
Phone: (03) 523 6981
Hours: 1700 - 2100
Sysop: David Laloum
Access: SEMI-OPEN
Machines: RBBS

System Name: Tomorrowland Direct
Phone: (07) 394 2300
Hours: 24 Hours EST

System Name: Twilight Zone
Phone: (046)25-0309
Hours: 24 Hours
Sysop: Peter Hewett
Access: Free
Machines: Commodore

System Name: Video Connection
Phone: (03) 754 4203
Hours: 24 Hours
Sysop: Robert Kroes

System Name: VIDEOTEX 4000
Phone: (03) 741 3295
Hours: 0700 - 2300 Mon-Fri
Access: SEMI-OPEN
Machines: VIDEOTEX

System Name: Yarra Valley BBS
Phone: (059)64-3126
Hours: 24 Hours
Sysop: Frank Connor
Access: Free
Machines: Commodore

System Name: Zela Remote TRS-80 System
Phone: (02) 627 4177
Hours: M/F24HrsW/e1900-0700
Sysop: Nick Andrews
Access: Reg/VA

System Name: ZENITH C64 BBS
Phone: (02) 477 7509
Hours: 24 Hours
Sysop: Tony Callahan
Access: OPEN
Machines: Commodore

System Name: ZOIST - RBBS
Phone: (03) 467 2871
Hours: 24 Hours
Sysop: Bob Fletcher
Access: OPEN
Machines: RBBS-PC

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Machines : .....

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